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PART B

SOLAR - GEOPHYSICAL DATA

ISSUED

MAY 1964

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 237
PART B

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

Issued
31 May 1964

SOLAR - GEOPHYSICAL DATA

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The descriptive text was republished November 1963.

DAILY SOLAR INDICES

Mar. 1964	American Relative Sunspot Numbers $R_{A'}$
1	6
2	2
3	0
4	1
5	2
6	1
7	1
8	0
9	0
10	0
11	9
12	23
13	23
14	26
15	22
16	25
17	13
18	11
19	11
20	14
21	22
22	31
23	5
24	28
25	25
26	16
27	13
28	11
29	2
30	0
31	1
Mean:	11.1

Apr. 1964	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	7	77
2	0	75
3	13	77
4	0	77
5	7	76
6	7	76
7	13	76
8	13	74
9	8	75
10	8	73
11	7	74
12	7	73
13	7	73
14	7	72
15	7	71
16	7	71
17	14	72
18	7	72
19	0	71
20	9	71
21	17	72
22	16	71
23	13	70
24	21	72
25	9	71
26	7	70
27	0	70
28	0	70
29	0	69
30	0	69
Mean:	7.7	73

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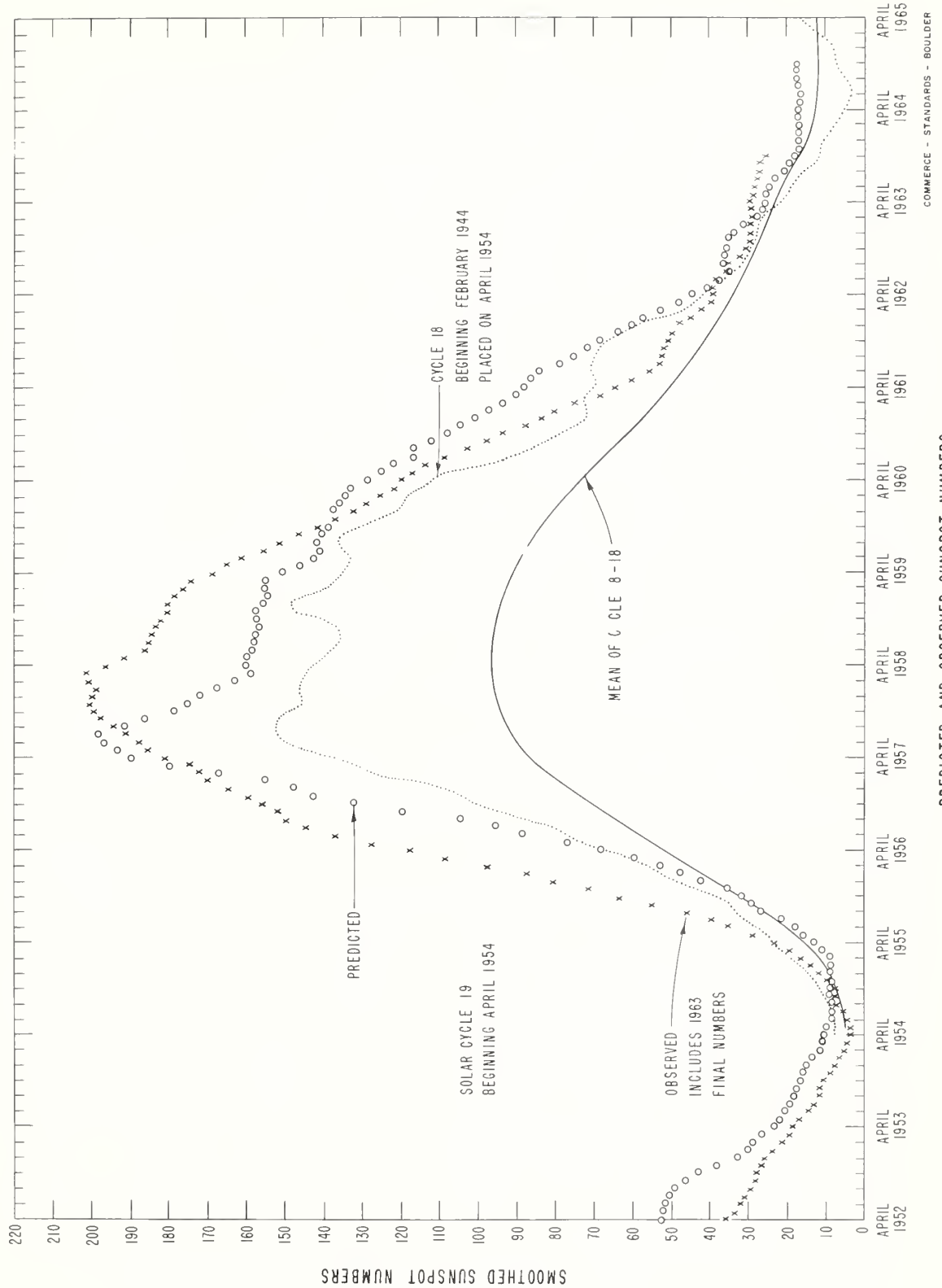

PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS

APRIL 1964

Apr. 1964	LAT.	McMATH PLAGE NUMBER	RETURN OF REGION	CALCIUM PLAGE DATA						SUNSPOT DATA		
				CMP VALUES		HISTORY	AGE (ROTATIONS)	DATE FIRST SEEN	DURATION (DAYS)	CMP VALUES		HISTORY
				AREA	INT					AREA	COUNT	
01.3	N01	7197(2)	New	(300)	(1)	b — d	1	3/27	1			
01.5	N25	7210	New	(300)	(1.5)	b ⌒ ℓ	1	4/4	4			
01.7	S02	7207(2)	New	(200)	(1.5)	b — d	1	4/3	1			
02.8	N02	7199(2)	New	(100)	(1.5)	b — d	1	3/29	1			
02.9	N56	7203	New	300	1.5	b ⌒ d	1	3/31	2			
03.4	N36	7208(2)	New	100	1.5	b — d	1	4/3	1			
03.8	S05	7200	7178	400	2	ℓ ⌒ d	2	<3/29	>10			
04.2	N10	7209	New	400	2	b ⌒ d	1	4/3	5			
04.3	N41	7211	New	100	1.5	b — d	1	4/4	2			
05.1	S04	7206(2)	New	(400)	(1)	b — d	1	4/1	1			
05.5	N10	7201	New	1200	3	ℓ — ℓ	1	3/30	13			
05.9	N32	7216	New	(200)	(1.5)	b — ℓ	1	4/9	2			
06.8	N11	7204	New	500	2.5	ℓ — ℓ	1	3/31	13			
07.0	N04	7205	7182	600	3	ℓ ⌒ ℓ	2	3/31	13			
08.4	N01	7212(2)	New	(200)	(1)	b — d	1	4/4	1			
08.7	N05	7223	New	(200)	(2.5)	b ⌒ ℓ	1	4/12	2			
09.1	N01	7214(2)	New	(200)	(2.5)	b — d	1	4/6	1			
09.2	S09	7225	New	(100)	(2)	b — ℓ	1	4/13	2			
09.4	S01	7226	New	(200)	(1)	b — ℓ	1	4/13	2			
09.8	S33	7227(2)	New	(200)	(1)	b — d	1	4/13	1			
09.9	N29	7215	New	100	1.5	b ⌒ d	1	4/7	4			
10.2	S36	7219(2)	New	100	1.5	b — d	1	4/9	1			
10.5	S18	7218(2)	New	100	1.5	b — d	1	4/9	1			
11.0	N08	7217	New	100	1	b ⌒ d	1	4/9	2			
11.1	N22	7228	New	(100)	(1)	b — ℓ	1	4/13	3			
11.9	N14	7213	New	1200	3	ℓ ⌒ ℓ	1	4/5	13	50	1	ℓ ⌒ d
13.5	S02	7234	New	400	1.5	b ⌒ ℓ	1	4/15	>3			
13.9	N24	7232	New	200	1.5	b ⌒ d	1	4/14	>4			
14.2	N22	7221(2)	New	(300)	(1.5)	b — d	1	4/10	1			
14.2	S05	7220	7183	(300)	(1)	ℓ ⌒ d	4	<4/9	>2			
14.3	N11	7235(2)	New	200	1.5	b — d	1	4/15	1			
15.2	N08	7233	New	500	1.5	b — d	1	4/14	>4			
15.2	S13	7229	New	200	3	b ⌒ d	1	4/13	>5	20	1	b — d
15.5	S32	7230(2)	New	(200)	(1)	b — d	1	4/13	1			
16.2	N02	7236	New	500	1.5	b — d	1	4/16	>2			
16.9	N11	7222	7189	800	2.5	ℓ ⌒ d	2	4/10	>8			
17.1	N20	7237(2)	New	100	2.5	b — d	1	4/16	≥2			
18.0	S45	7231(2)	New	(200)	(1)	b — d	1	4/13	1			
18.3	N09	7224	7187	1000	3	ℓ ⌒ ℓ	4	4/12	13	10	1	ℓ — d
19.6	S08	7251(2)	New	(100)	(2.5)	b — ℓ	1	4/25	1			
19.7	S01	7239(2)	New	(100)	(2)	b — d	1	4/17	1			
19.7	S09	7240(2)	New	(100)	(2)	b — d	1	4/17	1			
20.4	S08	7238(2)	New	(400)	(1.5)	b — d	1	4/16	1			
21.7	N36	7241(2)	New	(100)	(1)	ℓ — d	1	4/17	1			
22.1	N28	7242(2)	New	(200)	(2)	ℓ — d	1	4/17	1			
22.4	S32	7243(2)	New	(100)	(1.5)	ℓ — d	1	4/17	1			
22.9	S08	7244	New	700	3	b ⌒ ℓ	1	<4/22	7	100	10	b ⌒ d
23.4	N04	7248	New	300	1.5	b ⌒ d	1	4/23	2			
24.4	N10	7249	New	600	1.5	b ⌒ d	1	4/23	4			
25.1	S55	7245	New	200	1	b — d	1	<4/22	<2			
25.2	N03	7252(2)	New	100	2	b — d	1	4/26	1			
25.4	S15	7246	New	(200)	(2.5)	b — d	1	<4/22	<1			
25.7	S08	7247	New	400	1	b ⌒ d	1	4/22	<7			
27.6	N34	7254(2)	New	100	1.5	b — d	1	4/28	1			
27.9	S29	7257(2)	New	(100)	(1)	b — d	1	5/1	1			
28.8	N09	7253(2)	New	(200)	(2)	b — d	1	4/26	1			
28.9	N10	7266	New	(400)	(1.5)	b ⌒ ℓ	1	5/3	2			
29.4	S15	7250	New	500	2.5	ℓ ⌒ d	1	4/23	10			

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(1) No calcium plage data were secured at the McMath-Hulbert Observatory on April 2, 8, 18, 19, 20, 21, 27, 29 and 30.
(2) These very small and ephemeral plages last for only one day.

APRIL 1964

Apr. 1964	TIME MEAS. UT	LAT	MER DIST	TYPE	Apr. 1964	TIME MEAS UT	LAT	MER DIST	TYPE
1	No Obs.				12	1635	N09	E74	αf*
2-4	No Spots				13	2320	N09	E58	αf*
5	No Obs.				14	No Spots			
6	2240	N16	E63	αp	15	1855	S13	W06	β
7	2250	N17	E50	αp	16-18	No Spots			
8	2425	N17	E35	αp	19-24	No Obs.			
9	2305	N17	E21	αp	25	2425	S10	W43	βp**
10	2425	N17	E07	αp	26	1710	S09	W53	αp
11	1730	N17	W03	αp	27-30	No Spots			

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*Inconclusive
**Old Cycle Polarities Reversed

NOTE: In CRPL-F 236 the data for Mt. Wilson magnetic classification of sunspots were for March 1964, not February 1964 as labelled.

FINAL CORONAL LINE EMISSION INDICES

JANUARY 1964

CMP Jan 1964	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	9	11	20	22	16	20	20	24	20	32	5	7	27	37	4	4
2	14	17	15	20	20	56	19	22	13	18	5	6	11	15	4	7
3	12	14	9	16	18	37	9	14	10	14	10	13	10	12	11	13
4	10	14	9	11	11	14	10	12	8	12	9	11	9	10	7	8
5	15	18	11	15	11	18	14	18	7	8	15	18	10	14	16	18
6	7	11	9	11	3	6	12	15	6	8	30	36	13	14	18	28
7	10	18	8	12	7	9	11	16	24	73	36	50	13	17	18	24
8	12	17	15	24	4	6	17	19	16	34	21	36	13	20	14	20
9	12	16	12	15	6	7	11	13	6	8	7	9	12	14	4	6
10	19	25	12	19	10	11	10	15	13	14	x	x	32	39	x	x
11	23	34	11	13	9	17	12	16	12	17	10	14	17	20	6	10
12	19	28	6	10	9	13	5	6	18	34	x	x	39	50	x	x
13	18	32	21	30	10	18	18	20	10	11	17	26	26	42	13	20
14	21	28	18	23	15	19	18	26	5	8	7	10	31	53	14a	30a
15	48	68	9	10	10	15	8	11	10	12	x	x	46	67	x	x
16	29	41	11	15	5	9	10	14	23	26	19a	34a	40	56	10a	12a
17	25	34	10	20	8	10	16	20	11	15	x	x	55	66	x	x
18	20	24	7	10	8	10	15	24	9	11	x	x	25	35	x	x
19	22	31	18	26	5	8	20	22	9	17	16	20	10	21	13	17
20	21	42	22	35	7	11	14	24	13	22	14	18	5	8	10	12
21	14	20	19	20	4	8	22	28	x	x	18a	21a	x	x	16a	21a
22	7	8	14	16	3	3	16	20	4	6	26	28	8	11	23	28
23	8	9	10	15	5	7	6	8	x	x	x	x	x	x	x	x
24	25	31	x	x	17	23	x	x	x	x	x	x	x	x	x	x
25	19	36	10	18	9	12	6	7	x	x	x	x	x	x	x	x
26	51	98	x	x	28	61	x	x	6	9	10	12	17	32	16	22
27	22	31	22	28	7	8	17	20	6	10	6	10	19	39	8	11
28	14	16	7	9	9	13	6	8	5	8	x	x	6	8	x	x
29	20	22	x	x	16	27	x	x	x	x	x	x	x	x	x	x
30	15	22	15a	16a	26	32	9a	16a	x	x	x	x	x	x	x	x
31	32	38	x	x	24	31	x	x	6	8	11a	12a	6	7	16a	17a

x = no observations * = yellow line a = index computed from low weight data

COMMERCE - STANDARDS - BOULDER

FINAL CORONAL LINE EMISSION INDICES

FEBRUARY 1964

CMP Feb 1964	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	10	12	x	x	11	13	x	x	x	x	x	x	x	x	x	x
2	5	7	16	20	3	4	19	20	5	6	14	16	8	12	11	16
3	9	11	10	12	5	8	12	16	5	8	23	26	8	11	17	20
4	x	x	19a	27a	x	x	20a	29a	x	x	x	x	x	x	x	x
5	5	8	21	24	3	6	18	22	16	24	9	13	13	16	11	18
6	x	x	x	x	x	x	x	x	13	22	33	52	10	11	25	33
7	x	x	x	x	x	x	x	x	9	11	x	x	12	20	x	x
8	x	x	x	x	x	x	x	x	4	6	15	16	10	12	13	16
9	12	14	11	16	7	9	9	12	6	7	17	20	13	16	11	15
10	29	32	9	11	11	14	12	15	3	4	9	12	5	6	7	8
11	35	47	3	8	19	30	5	9	4	5	12	13	11	12	6	9
12	x	x	x	x	x	x	x	x	4	7	13	18	13	16	7	8
13	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14	12	15	9	12	4	9	16	18	3	5	8	9	5	6	6	8
15	33	36	x	x	25	35	x	x	8	11	5	9	7	8	6	7
16	10	17	13	16	3	5	11	14	4	5	15	18	4	4	10	3
17	9	17	17	26	4	6	14	15	x	x	x	x	x	x	x	x
18	9	16	x	x	8	10	x	x	x	x	x	x	x	x	x	x
19	14	19	10	19	8	12	8	12	4	7	44a	88a	5	9	46a	83a
20	29	50	31	57	19	64	31	76	8	18	7	9	13	29	10	17
21	58	85	x	x	13	28	x	x	12	20	28	33	38	87	46	80
22	26	53	18	23	7	11	12	14	x	x	x	x	x	x	x	x
23	15	28	17	24	4	5	14	17	4	6	36	41	33	61	76	136
24	5	10	8	12	3	3	8	9	9	19	x	x	19	36	x	x
25	7	12	16	40	3	5	9	14	x	x	x	x	x	x	x	x
26	5	6	15	22	4	6	10	14	15	19	10	15	15	21	7	9
27	14	17	x	x	21	29	x	x	5	6	7	8	9	18	8	13
28	9	21	12	24	3	5	8	10	x	x	x	x	x	x	x	x
29	19	24	22	42	21	24	4	8	14	16	x	x	46	61	x	x

x = no observations * = yellow line a = index computed from low weight data

FINAL CORONAL LINE EMISSION INDICES

MARCH 1964

CMP Mar 1964	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	19	24	22	42	21	24	4	8	x	x	x	x	x	x	x	x
2	12	28	19	25	10	25	22	26	x	x	x	x	x	x	x	x
3	x	x	x	x	x	x	x	x	18	35	10	13	8	11	10	15
4	x	x	x	x	x	x	x	x	9	12	13	16	8	18	12	14
5	9	14	8	13	10	12	7	9	4	7	11	12	7	9	12	16
6	9	14	13	16	7	12	11	15	9	22	x	x	5	6	x	x
7	8	11	25	28	7	14	30	41	19	53	19	38	9	11	7	8
8	11	15	28	36	13	39	47	84	12	27	21	32	9	10	12	16
9	12	18	x	x	5	8	x	x	x	x	x	x	x	x	x	x
10	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
11	22	36	5	7	13	19	8	13	14	42	13	16	36	76	10	14
12	12	16	7	10	2	3	9	12	x	x	x	x	x	x	x	x
13	x	x	x	x	x	x	x	x	3	3	9	10	18	22	8	16
14	36	40	x	x	18	23	x	x	4	6	10	11	6	8	10	12
15	26	33	x	x	19	22	x	x	5	6	13	16	9	12	9	10
16	x	x	x	x	x	x	x	x	8	12	9	12	8	11	8	10
17	12	18	13	19	10	21	10	12	3	4	9	10	2	3	10	12
18	18	32	14	24	7	25	8	9	x	x	x	x	x	x	x	x
19	23	50	11	13	6	15	8	9	6	9	7	8	27	63	14	24
20	26	44	x	x	5	8	x	x	x	x	x	x	x	x	x	x
21	21	43	12	16	2	6	13	16	4	6	11	16	31	68	13	18
22	18	32	17	32	3	3	15	16	6	17	9	9	25	50	10	16
23	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
24	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
25	8	11	8	12	7	14	7	10	x	x	x	x	x	x	x	x
26	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
27	33	81	19	40	6	14	16	19	x	x	x	x	x	x	x	x
28	33	75	18	32	6	8	14	23	x	x	x	x	x	x	x	x
29	11	12	18	32	11	24	15	24	x	x	x	x	x	x	x	x
30	9	12	14	26	20	47	14	31	x	x	x	x	x	x	x	x
31	3	10	19	32	6	10	15	25	x	x	x	x	x	x	x	x

x = no observations * = yellow line a = index computed from low weight data

PROVISIONAL CORONAL LINE EMISSION INDICES

APRIL 1964

CMP April 1964	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	x	x	x	x	x	x	x	x	7	11	18	23	7	9	11	15
2	5	7	10	14	4	5	10	12	3	4	13	20	3	4	8	13
3	x	x	x	x	x	x	x	x	3	6	8	10	9	12	11	18
4	26	42	20	26	6	14	11	14	6	17	9	11	29	42	12	20
5	37	67	17	28	6	18	10	16	3	6	10	12	14	29	13	20
6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	x	x	x	x	x	x	x	x	4	15	11	12	6	7	8	9
8	x	x	x	x	x	x	x	x	4	6	14	20	14	20	13	18
9	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
10	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
11	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
12	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
13	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
15	13	18	16	20	5	9	9	12	x	x	9	11	x	x	13	15
16	9	24	24	48	2	4	9	20	x	x	x	x	x	x	x	x
17	14	27	16	32	2	3	9	12	6	11	10	20	25	67	11	14
18	39	87	18	36	5	8	8	12	x	x	x	x	x	x	x	x
19	8	18	19	40	3	4	9	12	3	6	9	13	4	7	9	16
20	x	x	x	x	x	x	x	x	3	6	x	x	3	4	x	x
21	3	4	8	12	2	3	5	6	15	34	12	16	6	11	10	12
22	9	11	13	16	4	5	15	22	22	42	23	40	8	9	22	26
23	x	x	x	x	x	x	x	x	12	20	10	16	6	8	12	18
24	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
25	x	x	x	x	x	x	x	x	4	6	8	10	3	3	7	8
26	x	x	x	x	x	x	x	x	7	9	10	24	5	6	6	8
27	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29	x	x	15	22	x	x	16	20	x	x	11	16	x	x	7	9
30	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x = no observations * = yellow line emission a = index computed from low weight data

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

APRIL 1964

OBSERVATORY	DATE APR 1964	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg	CORR. AREA Sq. Deg	MAX. WIDTH Ha	MAX INT %	PROVISIONAL IONOSPHERIC EFFECT
	01	0000	0045	NO FLARE	PATROL											
	01	0715	0720	NO FLARE	PATROL											
	01	0915	0955	NO FLARE	PATROL											
	01	1015	1145	NO FLARE	PATROL											
	01	1935	1940	NO FLARE	PATROL											
	01	2200	2305	NO FLARE	PATROL											
	01	2345	2400	NO FLARE	PATROL											
	02	0000	0105	NO FLARE	PATROL											
	02	0110	0235	NO FLARE	PATROL											
MANILA	02	0305 E	0334	0307	N08	E71			1-	1	0307	1.00	1.90			
	02	0920	0935	NO FLARE	PATROL											
	02	1120	1125	NO FLARE	PATROL											
	02	1205	1220	NO FLARE	PATROL											
	03	0110	0210	NO FLARE	PATROL											
	03	1100	1105	NO FLARE	PATROL											
	03	1440	1530	NO FLARE	PATROL											
	03	1545	1550	NO FLARE	PATROL											
	03	1600	1735	NO FLARE	PATROL											
	04	0050	0115	NO FLARE	PATROL											
	04	0905	1145	NO FLARE	PATROL											
	04	1150	1255	NO FLARE	PATROL											
MANILA	05	0328 E	0345	0332	N15	E90			1-	1	0332	.22	1.10			
	05	0405	0450	NO FLARE	PATROL											
MANILA	05	0544	0600	0547	N15	E90			1-	1	0547	.25	1.25			
	05	1100	1145	NO FLARE	PATROL											
	05	1155	1220	NO FLARE	PATROL											
	05	1725	1750	NO FLARE	PATROL											
	05	2245	2330	NO FLARE	PATROL											
MANILA	06	0107	0116	0111	N15	E77			1-	2	0111	.33	.76			
MANILA	06	0345	0409	0348	N15	E76			1-	2	0348	.50	1.15			
	06	0920	1010	NO FLARE	PATROL											
	06	1035	1040	NO FLARE	PATROL											
	06	1200	1215	NO FLARE	PATROL											
	06	2355	2400	NO FLARE	PATROL											
	07	0125	0130	NO FLARE	PATROL											
MANILA	07	0142 E	0215	0151	N17	E67	7213	33 D	1	2	0151	1.30	2.02			
KODAIKNL	07	0157 E	□		N17	E66	7213		2	P	0157	2.60	6.90			
	07	0905	0910	NO FLARE	PATROL											
	07	0915	0955	NO FLARE	PATROL											
	07	1000	1045	NO FLARE	PATROL											
	07	1100	1240	NO FLARE	PATROL											
MCMATH	07	1306	1319	1307	N31	E30	7215		1-	2	1307	.20	.20			
	07	1320	1335	NO FLARE	PATROL											
LOCKHEED	07	2400	0030	0015	N38	W20			1-	2	0015	.20	.20		10	
CAPRI S	08	0838	0843		N21	W90	7210	5	1	2						

SOLAR FLARES

APRIL 1964

OBSERVATORY	DATE APR 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
MANILA	08	0839	0849	0842	N27	W90			1-	2	0842	.50	2.50			
LOCKHEED	08	1757	1815	1803	N06	W25			1-	2	1803	.20	.20		10	
LOCKHEED	08	2151	2204	2155	N14	W28			1-	2	2155	.50	.50		10	
	09	0140	0150	NO FLARE	PATROL											
	09	0430	0500	NO FLARE	PATROL											
	09	0520	0600	NO FLARE	PATROL											
SAC PEAK	09	1517 E	1532	1522	N16	E32			1-	C		.96	1.05		19	
MCMATH	09	1518	1532	1523	N16	E32	7213		1-	1	1523	.20	.30			
CAPRI S	09	1518	1533	1524	N16	E31			1-	3	1524	1.30	1.70			
SAC PEAK	10	0053	0100	0055	N15	E22			1-	C		.29	.29		17	
HTE-PROVEN	10	1203	1310	1247	N15	E19	7213	67	1		1247	2.70	3.00			
CAPRI S	10	1224	1304	1348	N14	E19	7213	40	1	2	1248	3.00	3.50			
LOCKHEED	10	2137	2215	2149	N12	W72			1-	2	2149	.20	.40		10	
MCMATH	10	2143	2205	2147	N12	W78	7201		1-	2	2147	.20	1.00			
LOCKHEED	11	0045	0140 D	0120	N16	E10	7213	55 D	1	1	0120	2.10	2.10		20	
SAC PEAK	11	0053	0120 D	0102	N15	E13			1-	C		1.11	.11		18	
MANILA	11	0058	0138	0106	N17	E12			1-	2	0106	.50	.50			
	11	0200	0210	NO FLARE	PATROL											
	11	0215	0230	NO FLARE	PATROL											
	11	0250	0320	NO FLARE	PATROL											
	11	0640	0700	NO FLARE	PATROL											
	11	0710	0805	NO FLARE	PATROL											
	11	1000	1010	NO FLARE	PATROL											
	11	1020	1045	NO FLARE	PATROL											
	11	1050	1115	NO FLARE	PATROL											
	11	1120	1215	NO FLARE	PATROL											
	11	1220	1250	NO FLARE	PATROL											
LOCKHEED	11	2236	2244	2239	N09	E90			1-	2	2239	.20	1.00		10	
MANILA	12	0819	0824	0821	N10	E86			1-	2	0821	.12	.32			
HTE-PROVEN	12	0825	0827 D		N10	E90			1-							
SAC PEAK	12	1545	1559	1549	N10	E79			1-	C		.35	.95		19	
MCMATH	12	1545	1600	1549	N11	E80	7224		1-	2	1549	.30	1.50			
LOCKHEED	12	1802	1825	1809	N09	E75			1-	2	1809	.30	.80		10	
MCMATH	12	1806	1814	1808	N11	E78	7224		1-	2	1808	.20	1.00			
LOCKHEED	12	1950	2005	1954	N09	E75	7224	15	1	2	1954	.40	2.30		10	
SAC PEAK	12	1950	2006	1953	N10	E77			1-	C		.33	.89		17	
MCMATH	12	1956	2006		N10	E77	7224		1-	1	1957	.40	1.50			
LOCKHEED	12	2350	0045	0010	N08	E75			1-	1	0010	.50	1.30		10	
SAC PEAK	13	0005	0010	0007	N10	E73			1-	C		.35	.74		17	
LOCKHEED	13	0022	0052	0030	N12	E63			1-	1	0030	.70	1.10		10	
MANILA	13	0741 E	0750		N11	E73			1-	1	0742	.20	.42			
	13	1645	1800	NO FLARE	PATROL											
	13	1810	1815	NO FLARE	PATROL											
LOCKHEED	13	1856	1954	1912	N07	E63			1-	1	1912	.50	.80		10	
MCMATH	13	1922	1930		N05	E58	7224		1-	1	1922	.30	.60			
MCMATH	13	1919	1930		N18	W30	7213		1-	1	1922	.30	.40			

COMMERCE - STANDARDS BOULDER

SOLAR FLARES

APRIL 1964

OBSERVATORY	DATE APR 1964	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX LAT.	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq Deg	CORR. AREA Sq Deg	MAX WIDTH Hα	MAX INT %	PROVISIONAL IONOSPHERIC EFFECT
LOCKHEED	13	2029	2045	2035	N10	E63			1-	1	2035	.20	.30		10	
LOCKHEED	13	2312	2327	2318	N07	E36			1-	1	2318	.30	.50		10	
LOCKHEED	13	2352	0010	2359	N07	E63			1-	1	2359	.20	.30		10	
	14	0100	0230	NO FLARE	PATROL											
CAPRI S	14	0752 E	0805		N12	E53	7224	13 D	1	2	0753	1.00	1.70			
	14	1805	1810	NO FLARE	PATROL											
	14	1835	1840	NO FLARE	PATROL											
	14	1905	1910	NO FLARE	PATROL											
LOCKHEED	14	2010	2100	2025	S13	E07			1-	2	2025	.20	.20		10	
LOCKHEED	14	2010	2100	2045	S13	E07			1-							
LOCKHEED	14	2235	2252	2240	N09	E46			1-	2	2240	.30	.40		10	
LOCKHEED	15	2124	2140	2130	N14	E55			1-	2	2130	.30	.30		10	
	15	2225	2315	NO FLARE	PATROL											
	16	0005	0040	NO FLARE	PATROL											
	16	0125	0140	NO FLARE	PATROL											
	16	1035	1115	NO FLARE	PATROL											
	16	1120	1130	NO FLARE	PATROL											
	16	1140	1205	NO FLARE	PATROL											
	16	1230	1300	NO FLARE	PATROL											
	16	1310	1335	NO FLARE	PATROL											
	16	1600	1605	NO FLARE	PATROL											
	17	0000	0150	NO FLARE	PATROL											
	17	2010	2040	NO FLARE	PATROL											
	17	2205	2305	NO FLARE	PATROL											
	18	0055	0200	NO FLARE	PATROL											
CAPRI S	18	1154 E	1204		N11	W01			1-	3	1154	1.00	1.00			
CAPRI S	18	1306	1339		N10	E03	7224	33	1	3	1306	2.10	2.10			
	18	1605	1625	NO FLARE	PATROL											
	18	1630	1700	NO FLARE	PATROL											
	18	1705	2400	NO FLARE	PATROL											
	19	0000	0035	NO FLARE	PATROL											
CAPRI S	19	0717	0734	0722	S05	E50	7244	17	1	3	0722	1.50	2.30			
CAPRI S	19	0741	0754	0748	S05	E50	7244	13	1	3	0748	1.50	2.30			
	19	1615	2340	NO FLARE	PATROL											
	19	2355	2400	NO FLARE	PATROL											
	20	0000	0010	NO FLARE	PATROL											
	20	0120	0130	NO FLARE	PATROL											
KODAIKNL	20	0202 E	□		S07	E41	7244		1	P	0202	1.93	2.56			
	20	0205	0215	NO FLARE	PATROL											
	20	0955	1010	NO FLARE	PATROL											
	20	1055	1110	NO FLARE	PATROL											
	20	1210	1220	NO FLARE	PATROL											
	20	1305	1315	NO FLARE	PATROL											
	20	1535	1550	NO FLARE	PATROL											

SOLAR FLARES

APRIL 1964

OBSERVATORY	DATE APR 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	20	1650	2250	NO FLARE	PATROL											
LOCKHEED	21	0037	0048	0042	S10	E27			1-	1	0042	.20	.20		10	
LOCKHEED	21	0102	0115	0105	S08	E26			1-	1	0105	.40	.40		10	
LOCKHEED	21	0105	0125	0112	N29	E15			1-	1	0112	.30	.30		10	
	21	0140	0145	NO FLARE	PATROL											
MANILA	21	0400 E	0409		S09	E27			1-	2	0441	.10	.10			
	21	0915	0920	NO FLARE	PATROL											
	21	0945	1000	NO FLARE	PATROL											
	21	1005	1020	NO FLARE	PATROL											
	21	1025	1030	NO FLARE	PATROL											
	21	1125	1135	NO FLARE	PATROL											
	21	1345	1405	NO FLARE	PATROL											
	22	1610	1640	NO FLARE	PATROL											
	22	1645	2310	NO FLARE	PATROL											
	23	0000	0020	NO FLARE	PATROL											
	23	0040	0200	NO FLARE	PATROL											
MANILA	23	0434	0445	0441	N01	W90			1-	2	0441	.16	.80			
	24	0100	0145	NO FLARE	PATROL											
CAPRI S	24	0640 E	0740		S09	W15	7244	60 D	1	3	0643	2.60	2.70			
	24	0920	0925	NO FLARE	PATROL											
CAPRI S	24	1214 E	1243 D		S12	W18			1-	2	1232	.70	.70			
HTE-PROVEN	24	1217	1310 D		S10	W22	7244	53 D	1		1232	2.70	2.80			
SAC PEAK	24	1239 E	1320	1253	S08	W23			1-	C		1.10	1.10		19	
LOCKHEED	25	1646	1718	1649	S08	W41			1-	2	1649	.30	.30		10	
LOCKHEED	25	1646	1718	1711	S08	W41			1-							
LOCKHEED	25	1730	1750	1736	S08	W41			1-	2	1736	.20	.20		10	
LOCKHEED	25	1805	1900	1810	S09	W42				2	1830	.40	.40		10	
LOCKHEED	25	1805	1900	1830	S09	W42										
LOCKHEED	25	1903	1945	1915	S09	W42			1-	2	1915	.70	.80		10	
MCMATH	25	1912	1918	1915	S10	W43	7244		1-	1	1915	.20	.30			
LOCKHEED	25	2047	2125	2050	S09	W42			1-	2	2050	.60	.70		10	
MCMATH	25	2048	2053	2050	S10	W43	7244		1-	2	2050	.20	.30			
	25	2210	2330	NO FLARE	PATROL											
KODAIKNL	26	0137 E	□		S08	W42			1-	P	0137	.64	.87			
	26	0915	0920	NO FLARE	PATROL											
	26	0925	0930	NO FLARE	PATROL											
	26	1045	1055	NO FLARE	PATROL											
LOCKHEED	26	1900	1920	1906	N36	W10			1-	2	1906	.20	.20		10	
	27	0150	0240	NO FLARE	PATROL											
	27	0435	0445	NO FLARE	PATROL											
CAPRI S	27	1110	1126		S12	E28			1-	3	1122	.80	.90			
	28	2120	2200	NO FLARE	PATROL											
	28	2205	2400	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

APRIL 1964

OBSERVATORY	DATE APR 1964	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	29	0000	0120	NO FLARE	PATROL											
	29	0130	0505	NO FLARE	PATROL											
	29	0515	0605	NO FLARE	PATROL											
	29	0755	0800	NO FLARE	PATROL											
	29	1300	1320	NO FLARE	PATROL											
	29	2355	2400	NO FLARE	PATROL											
	30	0245	0520	NO FLARE	PATROL											
	30	1150	1215	NO FLARE	PATROL											
	30	1230	1235	NO FLARE	PATROL											
	30	2355	2400	NO FLARE	PATROL											

COMMERCE - STRASBURG - BOULDER

ATHENES	ATHENS, GREECE
BAKOU	PIRCULI, USSR
CAPETOWN	ROYAL OBSERVATORY, CAPE OF GOOD HOPE
CAPRI F	CAPRI, ITALY (CERMAN)
CAPRI S	CAPRI, ITALY (SWEDISH)
CRIMÉE	SIMEIZ, USSR
HERSTMONCEU	ROYAL CREENWICH OBSERVATORY, HERSTHONCEUX, ENCLAND
HTE-PROVEN	HAUTE-PROVENCE
HONOLULU	HAWAII, USA
IKOMASAN	KYOTO, JAPAN
KIEV KO	KIEV GAO, USSR
KIEV KY	KIEV UNIVERSITY, USSR
LOCKHEED	LOS ANCELES, CALIF., USA
MCMATH	MCMATH-HULBERT PONTIAC, MICH., USA
MOSCOU	MOSCOW-GAISH, USSR
NEW SCHAUIN	FREIBURC, CFR
NERA	NEDERHORST den BERGH, NETHERLANDS
NIZMIR	KRASNAYA PAKHRA, USSR
SAC PEAK	SACRAMENTO PEAK, N.MEX. USA
SALTSJÖBADEN	STOCKHOLM, SWEDEN
SCHAUINS	SCHAUINSLAND, CFR
TACHKENT	TASHKENT, USSR
WENDEL	WENDELSTEIN, GFR

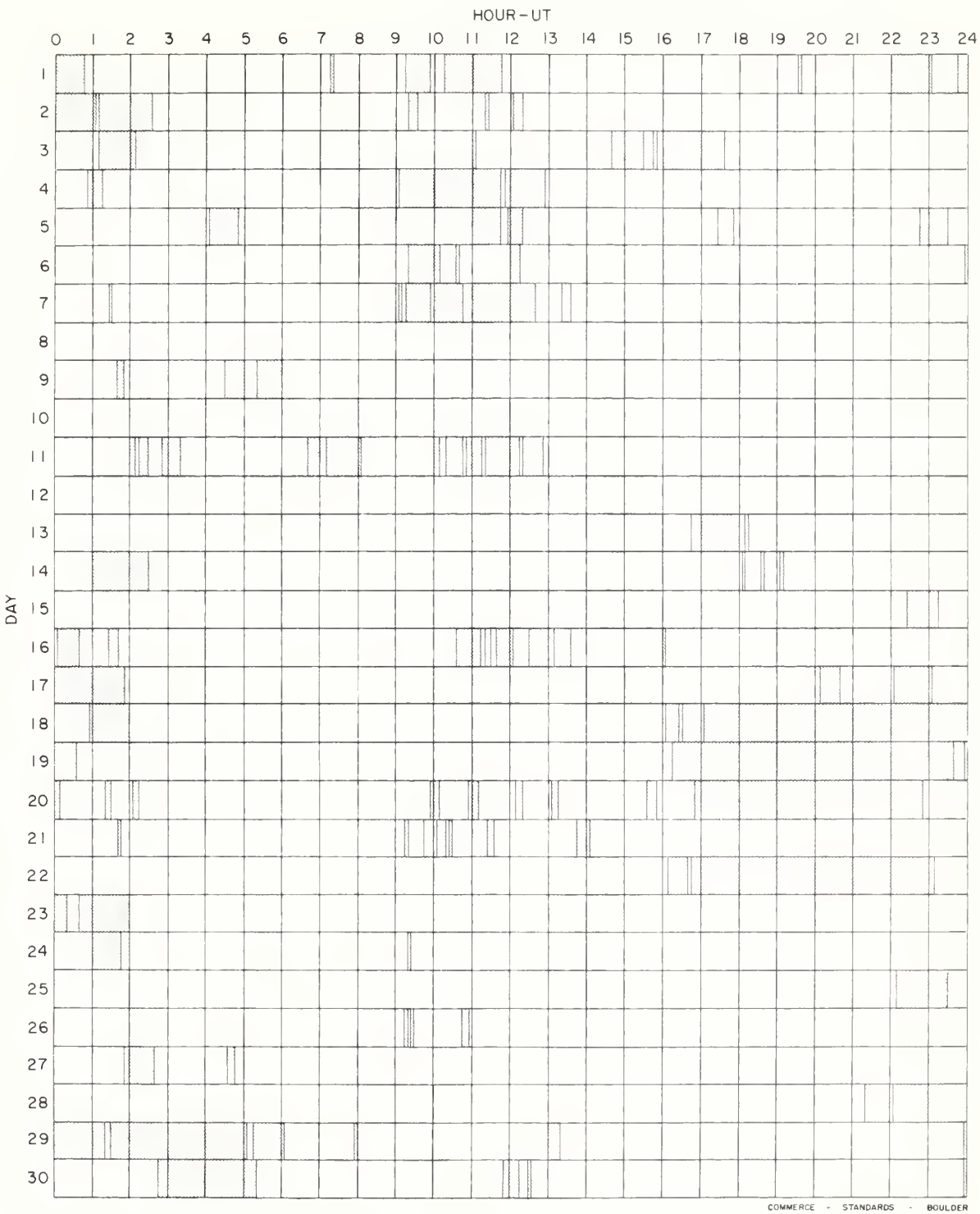
ALL VALUES IN THE MAXIMUM INTENSITY COLUMN FOR SAC PEAK ARE ARBITRARY UNITS (0-40) AND FOR LOCKHEED ARE ARBITRARY UNITS (10-40), NOT PERCENT OF CONTINUOUS SPECTRUM.

SEE DESCRIPTIVE TEXT PUBLISHED NOVEMBER 1961 FOR DEFINITION OF CORRECTED AREA VALUES LISTED FOR CLIMAX, HAWAII, LOCKHEED AND SACRAMENTO PEAK.

E = LESS THAN D = GREATER THAN U = APPROXIMATE □ = NOT REPORTED.

INTERVALS OF NO FLARE PATROL OBSERVATIONS

APRIL 1964



Observatories Included:

Capri S - (Swedish)	Kodaikanal	McMath-Hulbert
Haute-Provence	Lockheed	Ondrejov
Istanbul	Manila	Sacramento Peak

SOLAR FLARES

JANUARY 1964

OBSERVATORY	DATE JAN 1964	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX. LAT.	MER DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg	CORR. AREA Sq. Deg	MAX. WIDTH Ho	MAX. INT %	PROVISIONAL IONOSPHERIC EFFECT
	01	0300	0315	NO FLARE	PATROL											
	01	0700	0730	NO FLARE	PATROL											
	01	0745	0750	NO FLARE	PATROL											
	01	0800	0830	NO FLARE	PATROL											
	01	1110	1120	NO FLARE	PATROL											
	02	0045	0105	NO FLARE	PATROL											
	02	0155	0205	NO FLARE	PATROL											
CLIMAX	03	1540	1546	1542	N12	W02			1-		1542	.30	.30			
	04	0105	0120	NO FLARE	PATROL											
	05	0235	0245	NO FLARE	PATROL											
KODAIKNL	05	0723 E	0731	0723	S06	E40			1-	V				1.40	100	
ATHENES	05	1316 E	1340 D		S07	E37			1-	2	1317	.40	.50			
NIZAMIAH	06	0942	0949	0944	S08	W45	7084	7	1	2	0944	2.13	2.35	1.40		
	07	1240	1245	NO FLARE	PATROL											
	09	0200	0235	NO FLARE	PATROL											
	09	1555	1615	NO FLARE	PATROL											
SYDNEY	10	0348	0400	0352	S16	E27			1-	C	0352	.20	.33			
ABASTUMANI	10	0608 E	0856 D	0616	S07	W26	7096	168 D	1	3		1.80	2.02		65	
	13	0025	0040	NO FLARE	PATROL											
	14	0110	0230	NO FLARE	PATROL											
	14	0415	0500	NO FLARE	PATROL											
NIZAMIAH	16	1037	1046	1040	N11	W13	7102	9	1+	2	1040	2.13	2.25	1.60		
SYDNEY	17	0138	0230	0144	N11	W34			1-	C	0144	1.00	1.20			
MANILA	18	0157	0206	0201	N12	W45			1-	2	0201	.17	.20			
	18	1715	2300	NO FLARE	PATROL											
	19	1600	1615	NO FLARE	PATROL											
	19	1800	1840	NO FLARE	PATROL											
SYDNEY	21	0415	0419	0418	N09	E60	7108	4	1	C	0419	1.20	2.70			
NIZAMIAH	21	1034	1043	1037	S07	E53		9	1	2	1037	1.82	3.12	1.40		
	21	2355	2400	NO FLARE	PATROL											
	22	0025	0055	NO FLARE	PATROL											
SYDNEY	22	0122	0135	0127	N09	E51			1-	C	0127	1.00	1.50			
MITAKA	22	0245 E	0255		N11	E47	7108	10 D	1	V	0245	3.00	5.00	1.70	83	
MANILA	22	0254	0259 D	0257	N11	E48			1-	1	0257	.50	.55			
KODAIKNL	22	0740	0800	0750	N11	E44			1-	V	0750	.64	.94	1.40	100	

SOLAR FLARES

JANUARY 1964

OBSERVATORY	DATE JAN 1964	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX LAT	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS COND.	MEASUREMENTS TIME — U T	MEAS AREA Sq Deg	CORR AREA Sq Deg	MAX WIDTH Ha	MAX INT %	PROVISIONAL IONOSPHERIC EFFECT
CAPETOWN	22	0741	0820	0747	N11	E47	7108	39	1	C	0747	1.70	2.50			
TACHKENT	22	0743	0800 D	0748	N10	E47			1-	C	0748	1.60	2.40		75	
MANILA	22	0750 E	0804		N11	E46			1-	1	0755	1.25	1.50			
BUCHAREST	22	0758 E	0945 D		N12	E44	7108	107 D	2	1			6.60			
NIZAMIAH	22	0927	0937	0931	S08	E43		10	1+	2	0931	1.82	2.56	1.50		
	22	1620	1630	NO FLARE	PATROL											
	23	0035	0040	NO FLARE	PATROL											
	23	0050	0100	NO FLARE	PATROL											
SYDNEY	23	0310 E	0313		N12	E32			1-	P	0310	.80	.96			
	23	1755	1800	NO FLARE	PATROL											
	24	0405	0430	NO FLARE	PATROL											
	24	0440	0515	NO FLARE	PATROL											
	24	1600	1630	NO FLARE	PATROL											
CAPETOWN	26	1239	1413	1306	N10	W10	7108	94	1+	C	1306	4.70	4.90			
NIZAMIAH	28	1041	1055	1044	N01	W45	7113	14	1	2	1044	1.82	2.60	1.30		
ATHENES	28	1202 E	1238 D		S03	W47			1-	2		.30	.50			
HUANCAYO	28	1505 E	1514 D	1507	S03	W48			1-	V	1507	.64	.96	2.30		
MANILA	29	0115	0140	0119	S02	W53			1-	2	0119	.25	.28			
	29	0255	0300	NO FLARE	PATROL											
KODAIKNL	29	0645	0700	0652	S03	W57	7113	15	1	C	0657	1.61	2.96	1.52	100	
MANILA	29	0651	0700	0654	S02	W56			1-	2	0654	.50	.55			
MANILA	29	0755	0802	0757	S02	W56			1-	2	0757	.33	.36			
NIZAMIAH	29	1037	1047	1041	S04	W59	7113	10	1+	2	1041	1.22	2.35	1.60		
CLIMAX	29	1732	1739	1736	S02	W62			1-		1736	.60	.90			
	29	1955	2005	NO FLARE	PATROL											
	29	2115	2125	NO FLARE	PATROL											
	29	2340	2350	NO FLARE	PATROL											
	30	0015	0020	NO FLARE	PATROL											
MANILA	30	0130	0138	0133	S02	W66			1-	2	0133	.33	.33			
SYDNEY	30	0245	0248	0247	S03	W68			1-	C	0247	.40	1.20			
SYDNEY	30	0509	0514	0510	S03	W68			1-	C	0510	.40	1.20			
CLIMAX	30	1639	1645	1642	S04	W78			1-		1642	.30	.60			
	31	0035	0105	NO FLARE	PATROL											
	31	1145	1205	NO FLARE	PATROL											
	31	1400	1405	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

These flare reports are addenda to the January 1964 flares published in CRPL-F 2348 for February 1964.

ATHENES	ATHENS, CREECE	HONOLULU	HAWAII, USA	NERA	NEDERHORST den BERGH, NETHERLANDS
BAKOU	PIRCULI, USSR	IKOMASAN	KYOTO, JAPAN		
CAPETOWN	ROYAL OBSERVATORY, CAPE OF GOOD HOPE	KIEV KO	KIEV GAO, USSR	NIZMIR	KRASNAYA PAKHRA, USSR
		KIEV KY	KIEV UNIVERSITY, USSR	SAC PEAK	SACRAMENTO PEAK, N.MEX. USA
CAPRI F	CAPRI, ITALY (GERMAN)	LOCKHEED	LOS ANCELES, CALIF., USA	SALTSJÖBADEN	STOCKHOLM, SWEDEN
CAPRI S	CAPRI, ITALY (SWEDISH)	MCMATH	MCMATH-HULBERT PONTIAC, MICH., USA	SCHAUINS	SCHAUINSLAND, CFR
CRIMÉE	SIMEIZ, USSR			TACHKENT	TASHKENT, USSR
HERSTMONCEU	ROYAL GREENWICH OBSERVATORY, HERSTMONCEUX, ENGLAND	MOSCOU	MOSCOW-GAISH, USSR	WENDEL	WENDELSTEIN, GFR
HTR-PROVEN	HAUTE-PROVENCE	NEW SCHAUIN FREIBURG, CFR			

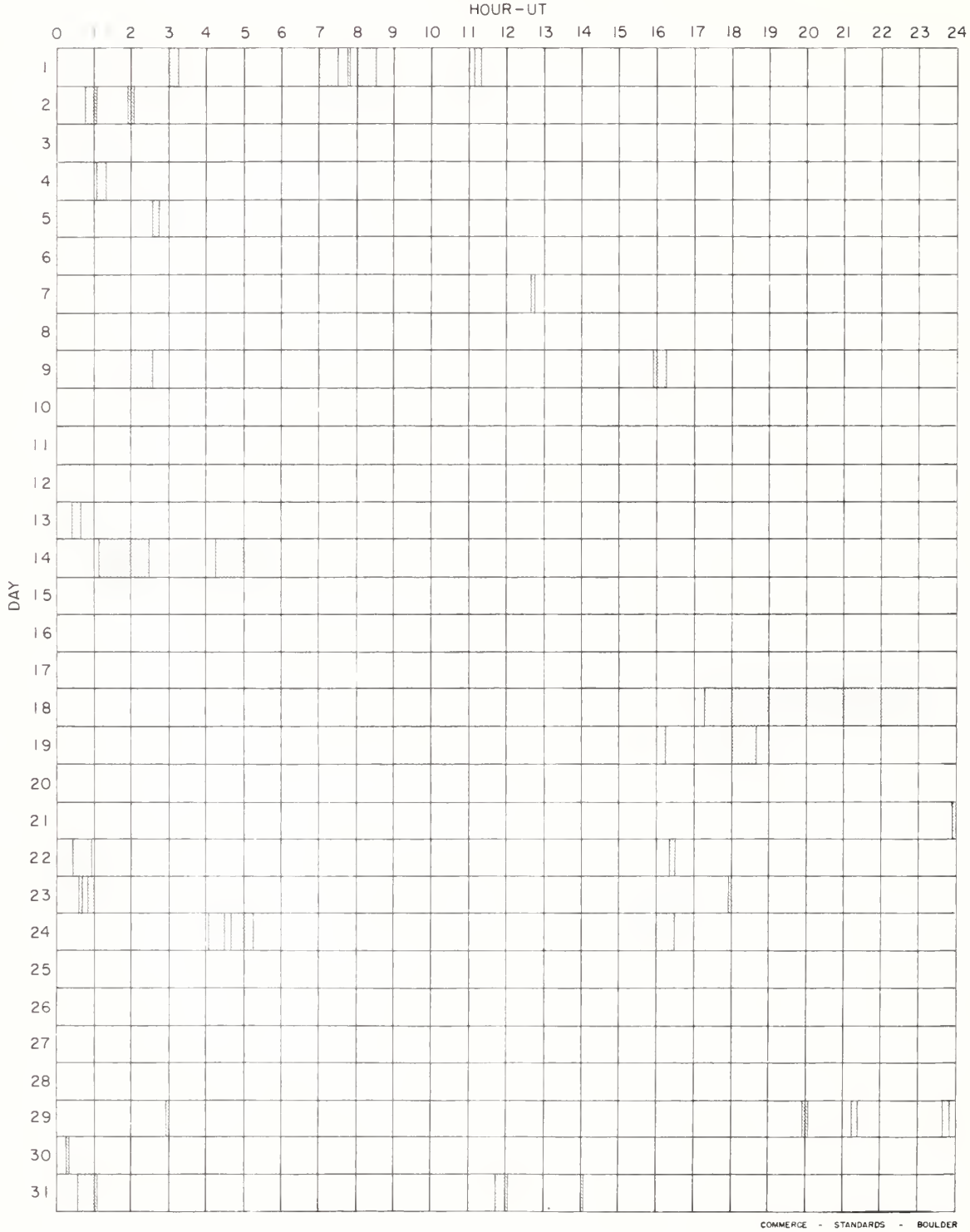
ALL VALUES IN THE MAXIMUM INTENSITY COLUMN FOR SAC PEAK ARE ARBITRARY UNITS (0-40) AND FOR LOCKHEED ARE ARBITRARY UNITS (10-40), NOT PERCENT OF CONTINUOUS SPECTRUM.

SEE DESCRIPTIVE TEXT PUBLISHED NOVEMBER 1961 FOR DEFINITION OF CORRECTED AREA VALUES LISTED FOR CLIMAX, HAWAII, LOCKHEED AND SACRAMENTO PEAK.

E = LESS THAN D = GREATER THAN U = APPROXIMATE □ = NOT REPORTED.

INTERVALS OF NO FLARE PATROL OBSERVATIONS

JANUARY 1964



Observatories included:

Abastumani	Capetown	Huancayo	Manila	Ottawa	Voroshilov
Arcetri	Capri-S (Swedish)	Ikomasan	McMath-Hulbert	Sacramento Peak	Wendelstein
Arosa	Climax	Kiev-KO	Mitaka	Sydney	Zurich
Athenes	Crimee	Kodaikanal	Nizamiah	Tachkent	
Bakou	Haute-Provence	Locarno	Nizmir	Thessaloniki	
Bucharest	Herstmonceux	Lockheed	Ondrejov	Uccle	

SHORT WAVE RADIO FADEOUTS — SUDDEN PHASE ANOMALIES
SUDDEN COSMIC NOISE ABSORPTION — SUDDEN ENHANCEMENTS OF SIGNAL
SUDDEN ENHANCEMENTS OF ATMOSPHERICS — SUDDEN FREQUENCY DEVIATIONS
SOLAR NOISE BURSTS AT 18 Mc/s

MARCH 1964

MAR. 1964	UNIVERSAL TIME			TYPE SWF	IMPORTANCE						BUR	WIDE SPREAD INDEX	STATIONS	KNOWN FLARE
	START	END	MAX	IMP	ABS	SCNA	SEA	SPA	SES	SFD				
16	0446	0540	0502						2			1	DE	0446
16	0450	0510		S 2								4	CA MA	
16	1553	1614	1557							10		1	BO(WWV10-1.0,WWV15-0.6)	1553E
16	1555	1700	1616		20	1						5	BO ON PU	
16	1555	1820	1601					72				5	BO(CYZ72,NSS68,NBA54,GBR47,NAA32 NPG22),KU,PU	
16	1556	1730	1625	SL 3								5	MC BE BO FM JU NE PU WS	
16	1556	1732	1621				2+					5	BO A3 JU KU LO ON PU	
16	1557	1718	1612						2			1	A3	

COMMERCE - STANDARDS - BOULDER

DE = New Delhi, India
ON = Ondrejov, Czechoslovakia

NOTE: In CRPL-F 236, April 1964, in the February 1964 table the first station for the two events listed should be "MC" not "ML".

RIOMETER EVENTS

(Provisional)

MARCH 1964

South Pole **26 Mc/s**

MAR. 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS	MAR. 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS
1	*					13	*				
2	*					14	*				
3	1016	1212	1058	3	10	15	*				
4	0548	0719	0620	4	1	16	*				
4	0958	1027	1006	3	1	17	*				
4	1256	1627	1416	18	2	18	*				
4	2038	2316	2135	51	2	19	*				
5	0117	0322	0155	40	3	20	*				
5	0745	1848	1335	20	3	21	*				
5	2316	0440	2358	49	1	22	*				
6	0903	1703	1047	10	2	23	*				
7	0045	0246	0051	38	2	24	*				
7	0846	2216	1516	14	1	25	*				
8	0006	0443	0229	23	2	26	*				
8	0849	1717	1146	23	3	27	*				
9	0147	0714	0338	20	1	28	**				
9	1349	1520	1444	6	3	29	**				
10	1748	2157	1818	7	1	30	*				
11	0938	1319	1007	10	2	31	*				
12	*										

COMMERCE - STANDARDS - BOULDER

* No Data
** No Event

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

APRIL 1964

ARO - OTTAWA 2800 Mc/s

APR. 1964	URANE	DESCRIPTIVE TYPE	START UT	DURATION HRS. MIN.	MEAN FLUX	MAXIMUM TIME	MAXIMUM FLUX	REMARKS
None observed.								

COMMERCE - STANDARDS - BOULDER

NOTE: In CRPL-F 232, December 1963, through CRPL-F 236, April 1964, the information in the columns entitled MEAN FLUX and MAXIMUM TIME FLUX have been misplaced for the data of November 1963 through March 1964.

The time of maximum has been in the column "MEAN FLUX".

The mean flux has been in the column "MAXIMUM FLUX".

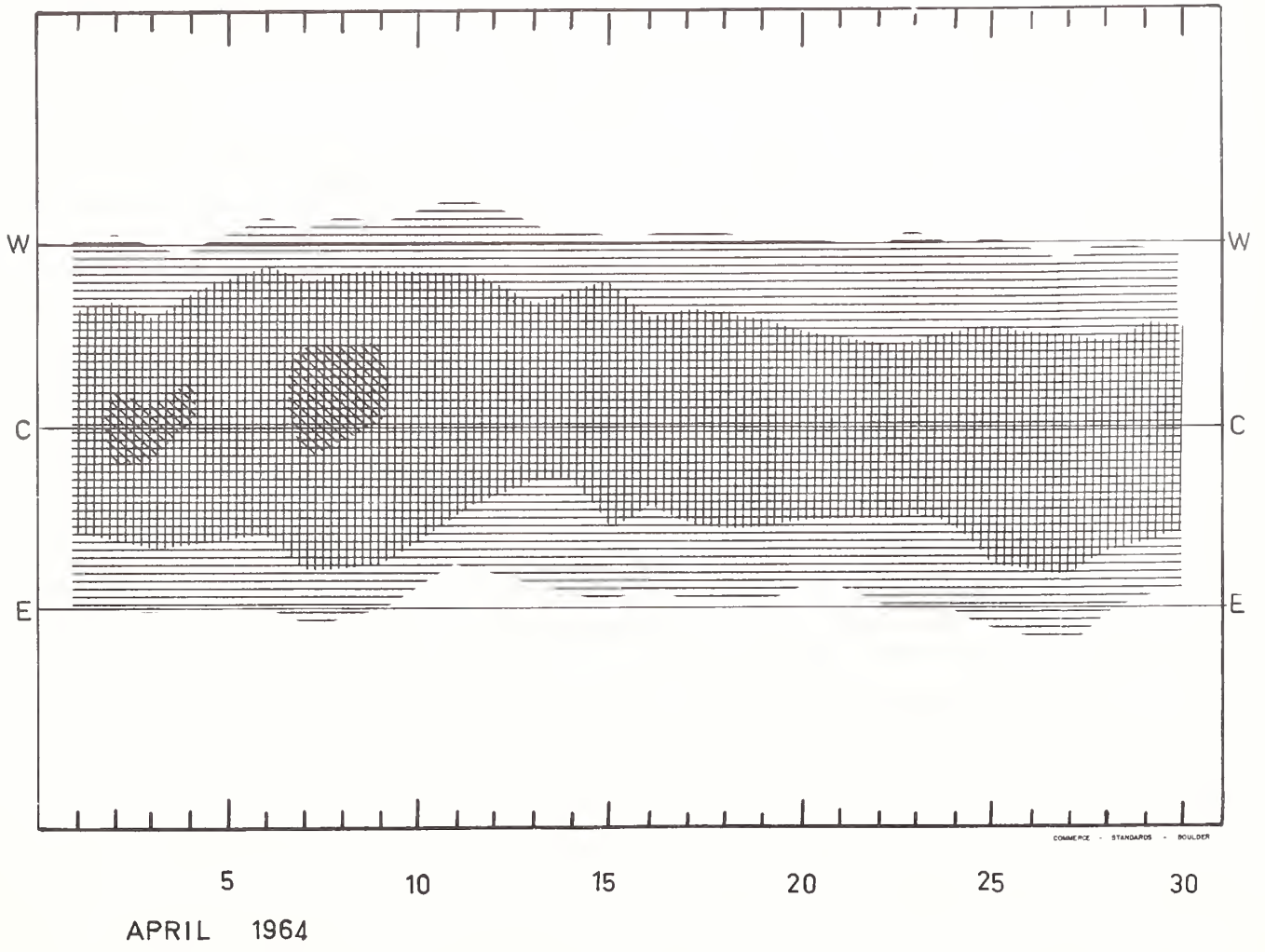
The maximum flux has been in the column "MAXIMUM TIME".

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATIONS

APRIL 1964

NANÇAY

169 Mc/s



SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

APRIL 1964

NBS BOULDER 108 Mc s

Apr. 1964	TYPE	START UT	TIME OF MAXIMUM UT	DURATION MINUTES	INTENSITY
2	3	1955.9	1956.5	1.1	2
27	3	1230.8	1231.0	1.1	3
28	3	1730.9	1731.0	1.1	2

COMMERCE - STANDARDS - BOULDER

NOMINAL TIMES OF OBSERVATION

APRIL 1964

NBS BOULDER 108 Mc s

Apr. 1964	HOURS OF OBSERVATION	UT	Apr. 1964	HOURS OF OBSERVATION	UT
1	1250-0109	2046-2311	16	1226-0122	
2	1248-0110		17	1225-0123	
3	1246-0111		18	1223-0124	
4	1245-1713;		19	1222-0125	
	1948-2231;		20	1220-0126	1220-1445;
	2245-0112				1643-2100
5	1243-0112				
			21	1219-0127	
6	1242-0113		22	1218-0128	
7	1240-0114		23	1216-0129	
8	1239-0115	1656-1713	24	1215-0130	
9	1237-0116		25	1213-0131	
10	1235-0117				
			26	1212-0132	
11	1234-0117		27	1211-0132	
12	1232-0118		28	1209-0133	
13	1231-0119		29	1208-0134	
14	1229-0120		30	1207-0135	
15	1228-0121				

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JANUARY 1964

Fort Davis

50-320 Mc/s

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U.T	INT		
Jan. 1	1415-2349					
Jan. 2	1415-2349					
Jan. 3	1415-2349					
Jan. 4	1415-2349					
Jan. 5	1415-2349					
Jan. 6	1415-2349					
Jan. 7	1415-2349					
Jan. 8	1415-2349					
Jan. 9	1415-2349					
Jan. 10	1415-2353					
Jan. 11	1415-2353					
Jan. 12	1415-1749; 1839-2353	IIIG	2326-2328	2	290-<50	
Jan. 13	1415-2353					
Jan. 14	1415-2353					
Jan. 15	1415-2355					
Jan. 16	1415-2355					
Jan. 17	1415-2355					
Jan. 18	1415-2355					
Jan. 19	1415-2355					
Jan. 20	1415-2358					
Jan. 21	1415-2358					
Jan. 22	1415-2358					
Jan. 23	1415-2358					Weak I during day
Jan. 24	1415-2358					Weak I during day
Jan. 25	1400-2400					
Jan. 26	1400-2400	I	1418-1433	2	140-100	
Jan. 27	1400-2400					
Jan. 28	1400-2400					
Jan. 29	1400-2400	IIIG	1733-1737	1	320-<50	1736: Reverse drift 170-160 Mc/s
Jan. 30	1400-2400					
Jan. 31	1400-2400					

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

FEBRUARY 1964

Fort Davis

50-320 Mcs

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U T	INT		
Feb. 1	1400-2400					
Feb. 2	1400-2400					
Feb. 3	1400-2400					
Feb. 4	1400-2400					
Feb. 5	1400-1523; 1533-1709; 1755-2400					
Feb. 6	1400-2400					
Feb. 7	1400-2400					
Feb. 8	1400-2400					
Feb. 9	1400-2400					
Feb. 10	1400-2400					
Feb. 11	1400-2400					
Feb. 12	1400-2400					
Feb. 13	1400-2400					
Feb. 14	1400-2400					
Feb. 15	1400-2400					
Feb. 16	1400-2400					
Feb. 17	1400-2400					
Feb. 18	1400-2400					
Feb. 19	1400-2400					
Feb. 20	1400-2400					
Feb. 21	1400-2228					
Feb. 22	1400-2400					
Feb. 23	1400-2400					
Feb. 24	1400-2400					
Feb. 25	1400-2400					
Feb. 26	1400-2400					
Feb. 27	1400-2400					
Feb. 28	1400-2400					
Feb. 29	1400-2400	IIIG IIIG	1749-1750 1751-1754	1 1	200-<50 175-<50	1745: Type V

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MARCH 1964

Fort Davis

50 - 320 Mc/s

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U.T	INT		
Mar. 1	1331-2330					
Mar. 2	1330-2330					
Mar. 3	1331-2330					
Mar. 4	1330-2330					
Mar. 5	1535-2330					
Mar. 6	1331-2330					
Mar. 7	1330-2330					
Mar. 8	1330-2330					
Mar. 9	1330-2330					
Mar. 10	1330-2330					
Mar. 11	1331-2330					
Mar. 12	1330-2330					
Mar. 13	1330-2330					
Mar. 14	1330-2330					
Mar. 15	1330-2330					
Mar. 16	1330-2330	II	1557.7-1608	3	220-<50	
		IV	1605-1608	1	320-180	
		IIIG	1604-1616	2	150-<50	
Mar. 17	1330-2329					
Mar. 18	1330-2330					
Mar. 19	1331-2330					
Mar. 20	1330-2330	IIIG	1659-1701	2	240-<50	
Mar. 21	1331-2329					
Mar. 22	1330-2330					
Mar. 23	1330-2330					
Mar. 24	1331-2330					Weak I during day
Mar. 25	1330-2330					
Mar. 26	1331-2330					
Mar. 27	1330-2330					
Mar. 28	1331-2329					
Mar. 29	1331-2330					
Mar. 30	1330-2330					
Mar. 31	1331-2330					

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

APRIL 1964

High Altitude Observatory
Boulder **7.6-41 Mc/s**

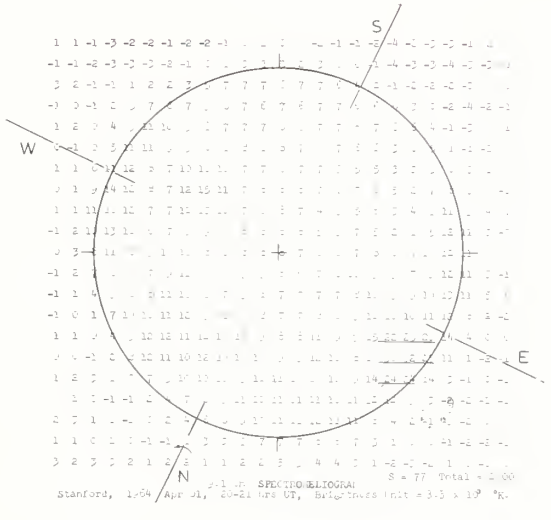
Date APR. 1964	Bursts			Frequency Range (Mc/s)
	Type	Time (U.T.)	Intensity	
3 Apr	No observ.	2200-2400		
4	No observ.	1400-2400		
9	III	2317-2318:15	1-	20-41
11	III	0020:30-0021	1+	16-41
	III	0021:30-0022:15	1+	16-41
	III	0023:15-0024	1	16-41
	III	0024:30-0025:15	1	16-41
	III	0025:30-0026	1-	20-41
	IV	0025-0040	1-	20-25
	III	0050:45-0051:30	1-	18-41
12	III	1426:15-1426:45	1-	27-41
14	III	1828-1828:15	1-	32-41
18	III	1306-1306:45	1-	18-34
	continuum	1400-1445	1-	24-36
	III	2159:30-2200:30	1	15-41

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

APRIL 1964

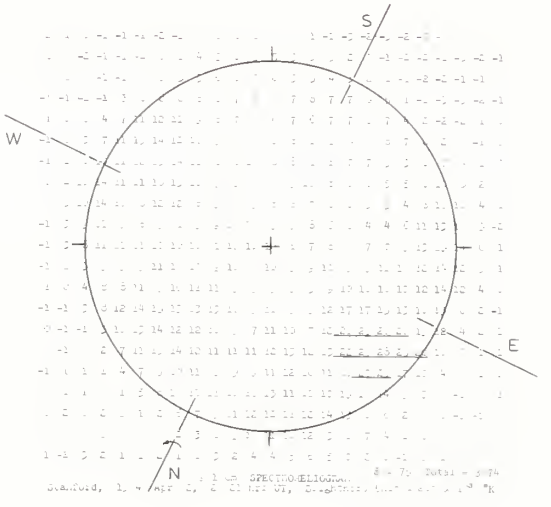
STANFORD

9.1 cm



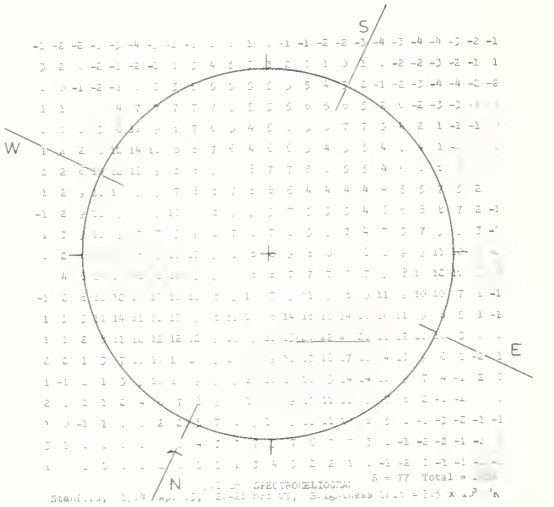
9.1 cm SPECTROHELIOGRAM S = 77 Total = 3600

Stanford, 1964 Apr 01, 20-21 hrs UT; Brightness Unit = 3.5 x 10^3 °K.



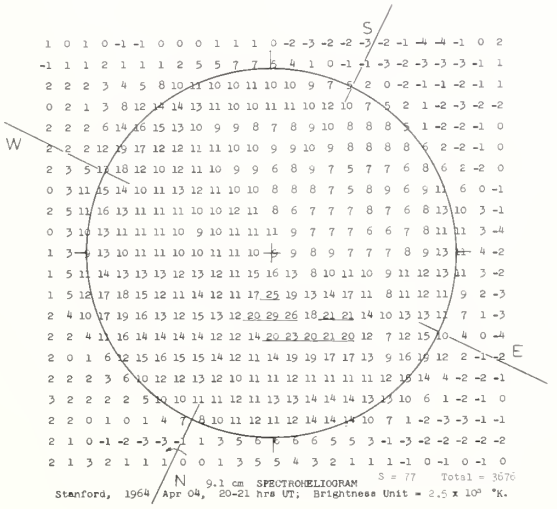
9.1 cm SPECTROHELIOGRAM S = 75 Total = 3674

Stanford, 1964 Apr 02, 20-21 hrs UT; Brightness Unit = 3.5 x 10^3 °K.



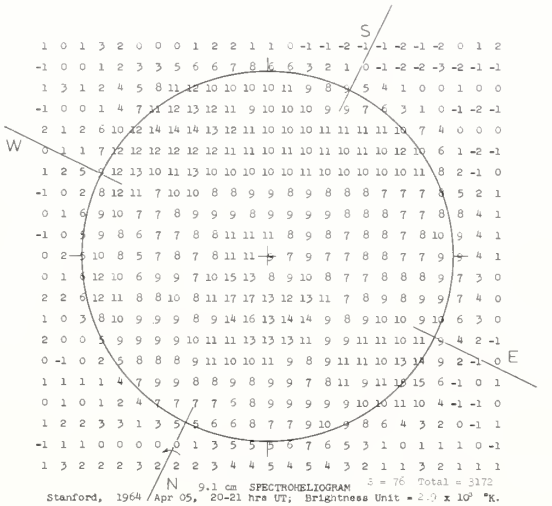
9.1 cm SPECTROHELIOGRAM S = 77 Total = 3600

Stanford, 1964 Apr 03, 20-21 hrs UT; Brightness Unit = 3.5 x 10^3 °K.



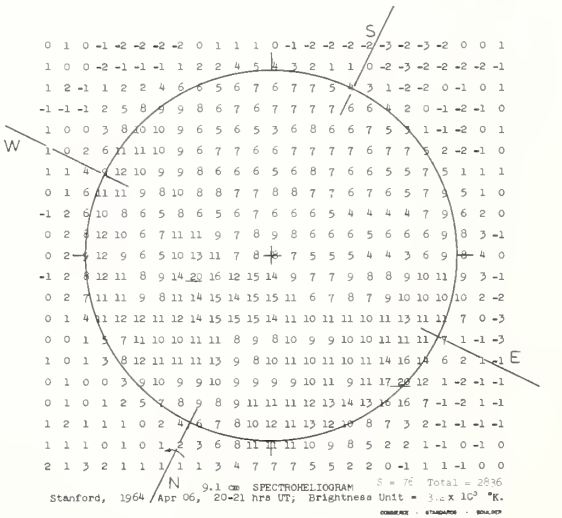
9.1 cm SPECTROHELIOGRAM S = 77 Total = 3676

Stanford, 1964 Apr 04, 20-21 hrs UT; Brightness Unit = 2.5 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 76 Total = 3172

Stanford, 1964 Apr 05, 20-21 hrs UT; Brightness Unit = 2.9 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 76 Total = 2836

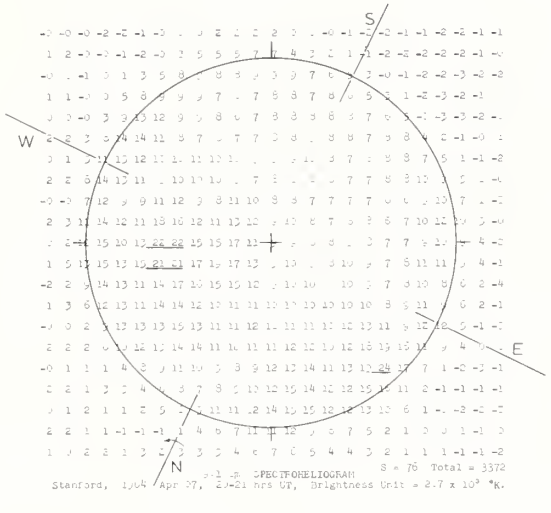
Stanford, 1964 Apr 06, 20-21 hrs UT; Brightness Unit = 3.6 x 10^3 °K.

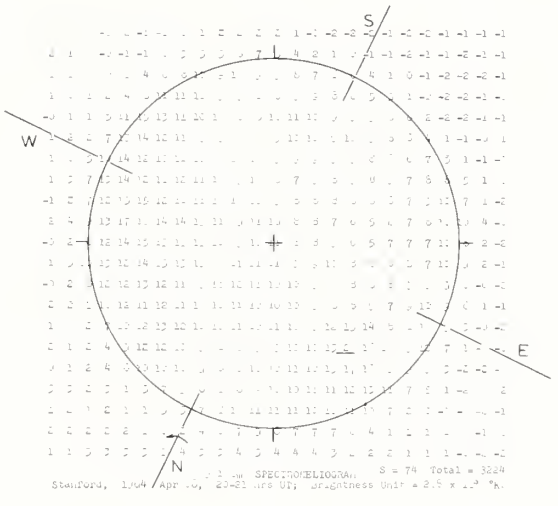
SOLAR RADIO EMISSION SPECTROHELIOGRAMS

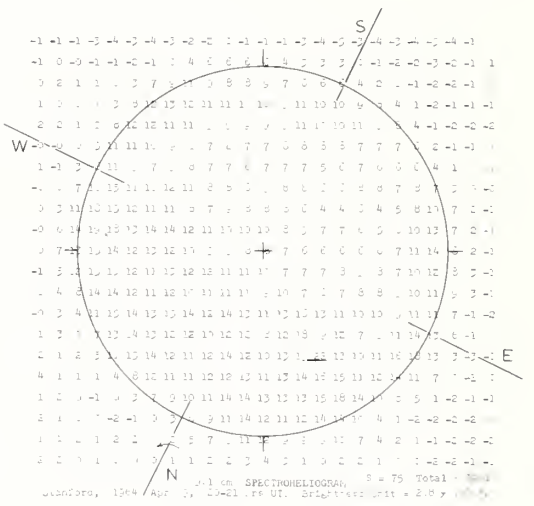
APRIL 1964

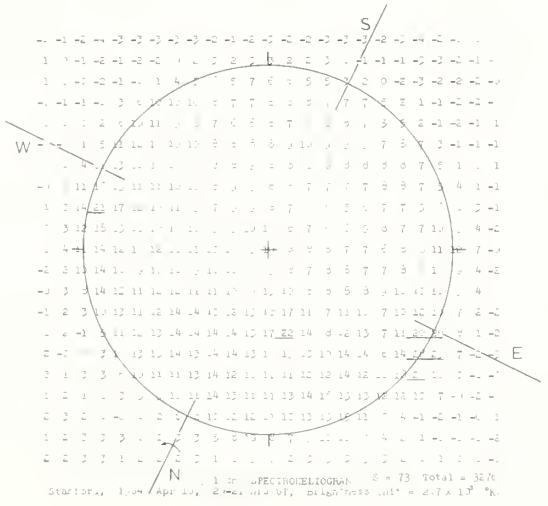
STANFORD

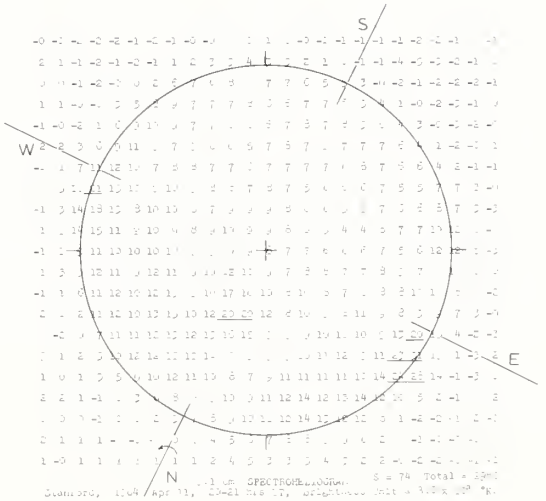
9.1 cm

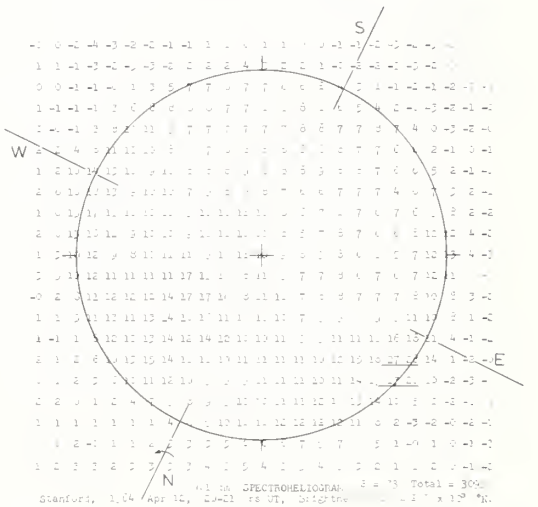










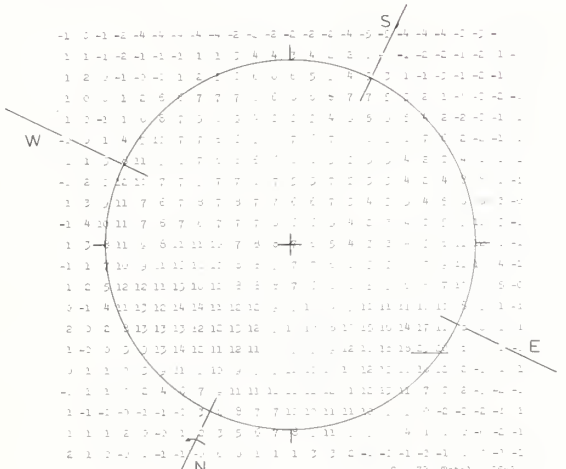


SOLAR RADIO EMISSION SPECTROHELIOGRAMS

APRIL 1964

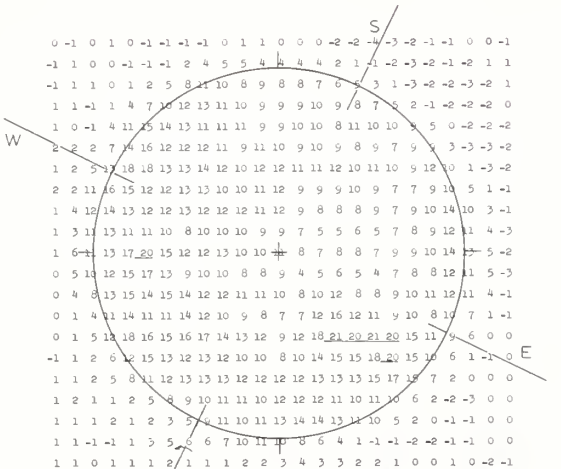
STANFORD

9.1 cm



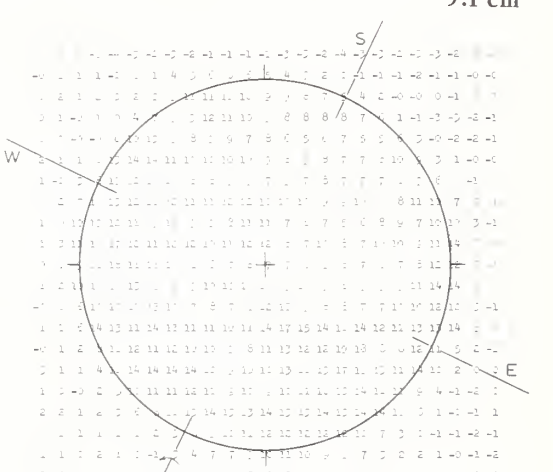
9.1 cm SPECTROHELIOGRAM S = 73 Total = 2553

Stanford, 1964 Apr 13, 20-21 hrs UT; Brightness Unit = 2.5 x 10^3 °K.



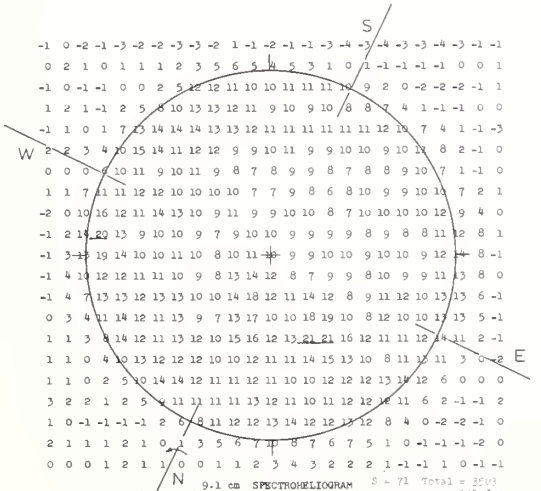
9.1 cm SPECTROHELIOGRAM S = 72 Total = 2987

Stanford, 1964 Apr 14, 20-21 hrs UT; Brightness Unit = 2.5 x 10^3 °K.



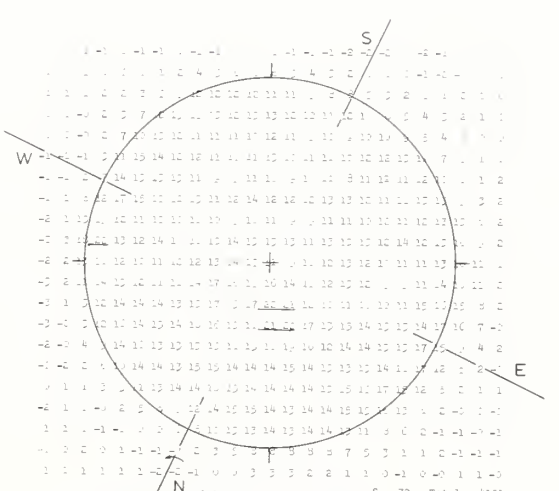
9.1 cm SPECTROHELIOGRAM S = 71 Total = 3308

Stanford, 1964 Apr 15, 20-21 hrs UT; Brightness Unit = 2.6 x 10^3 °K.



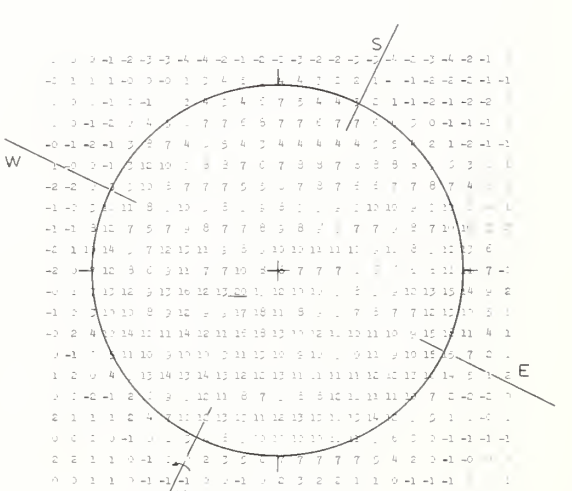
9.1 cm SPECTROHELIOGRAM S = 71 Total = 3503

Stanford, 1964 Apr 16, 20-21 hrs UT; Brightness Unit = 2.5 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 72 Total = 4131

Stanford, 1964 Apr 17, 20-21 hrs UT; Brightness Unit = 2.1 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 72 Total = 2894

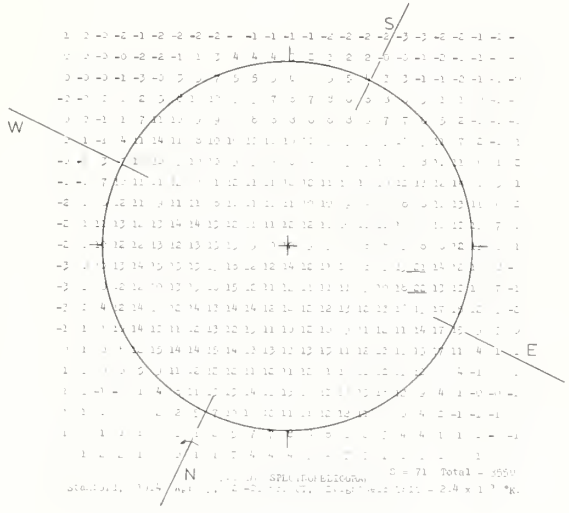
Stanford, 1964 Apr 18, 20-21 hrs UT; Brightness Unit = 3.0 x 10^3 °K.

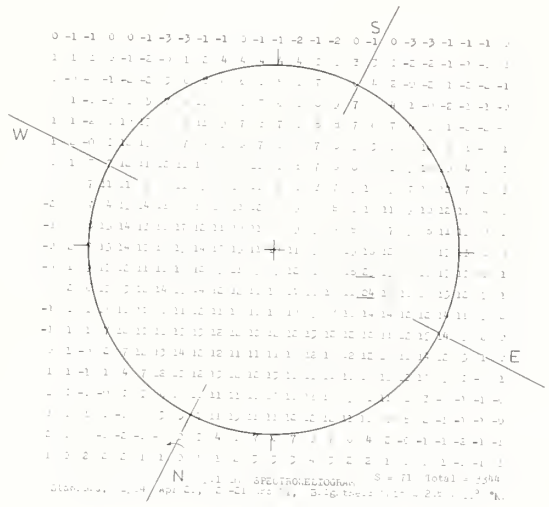
SOLAR RADIO EMISSION SPECTROHELIOGRAMS

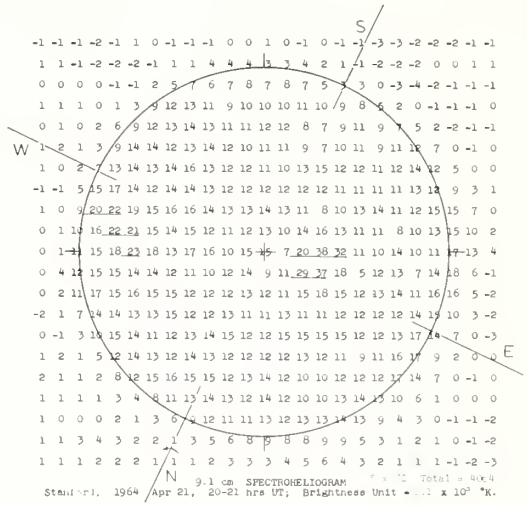
APRIL 1964

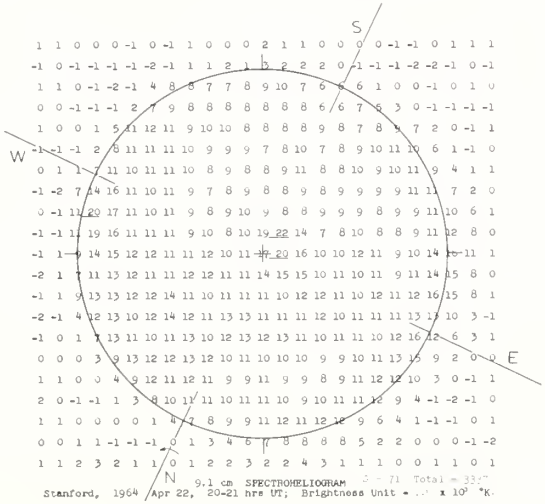
STANFORD

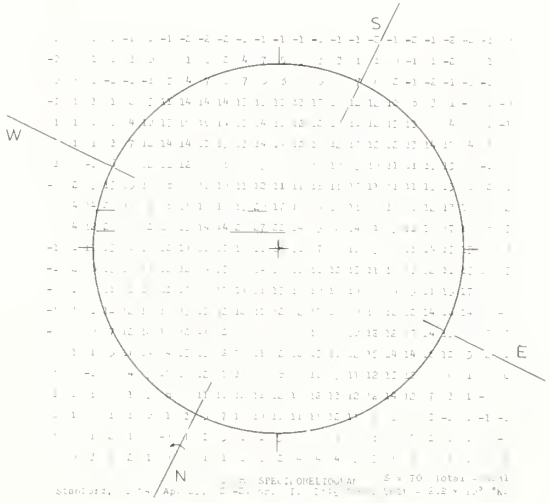
9.1 cm

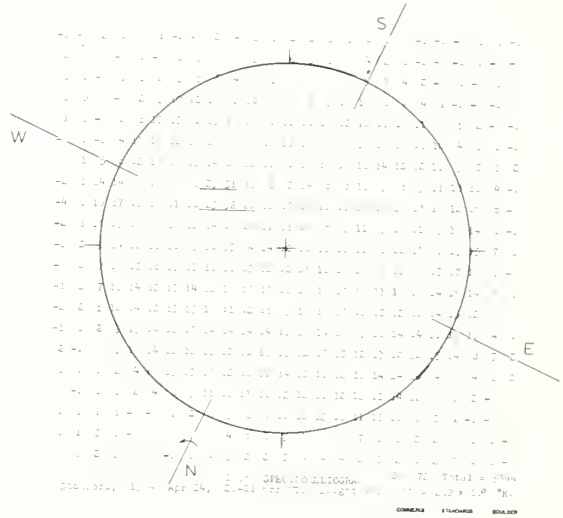












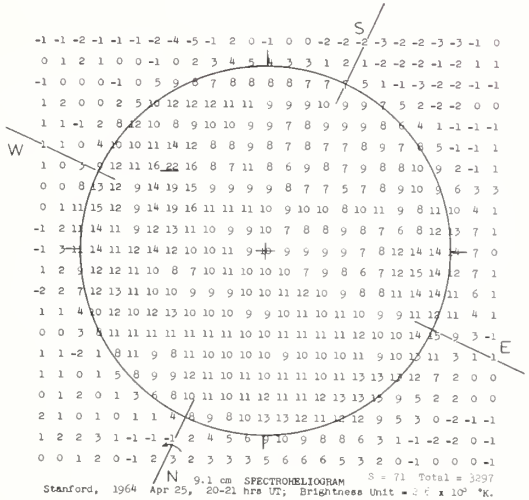
IVK

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

APRIL 1964

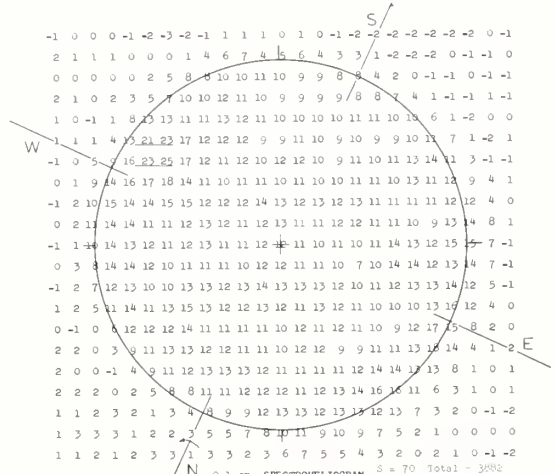
STANFORD

9.1 cm



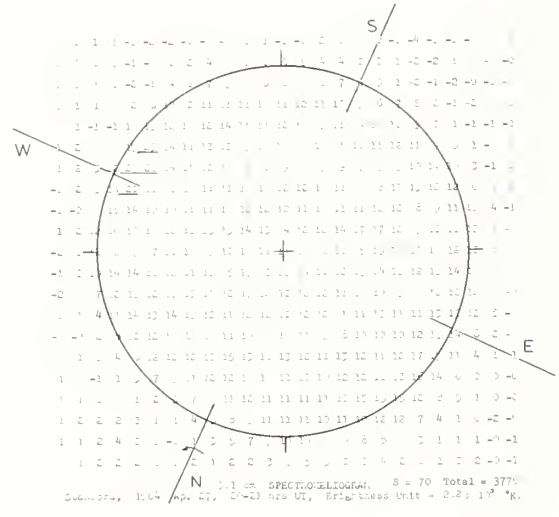
9.1 cm SPECTROHELIOGRAM S = 71 Total = 3297

Stanford, 1964 Apr 25, 20-21 hrs UT; Brightness Unit = [illegible] x 10^3 °K.



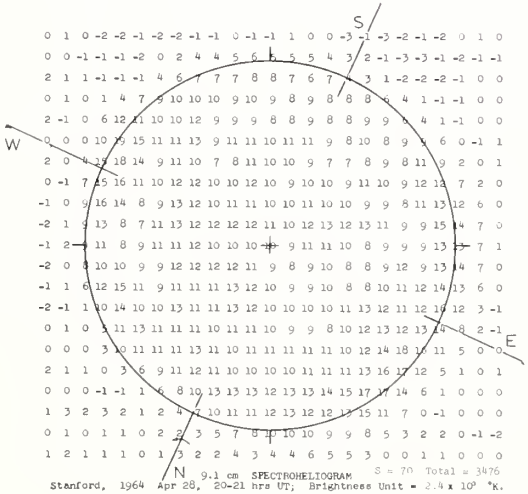
9.1 cm SPECTROHELIOGRAM S = 70 Total = 3882

Stanford, 1964 Apr 26, 20-21 hrs UT; Brightness Unit = [illegible] x 10^3 °K.



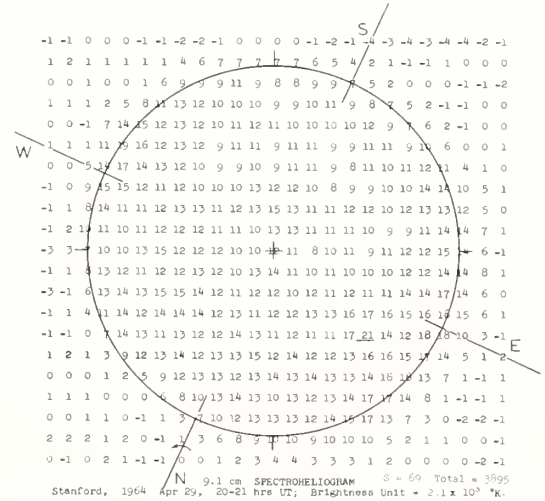
9.1 cm SPECTROHELIOGRAM S = 70 Total = 377[illegible]

Stanford, 1964 Apr 27, 20-23 hrs UT; Brightness Unit = 2.2 x 10^3 °K.



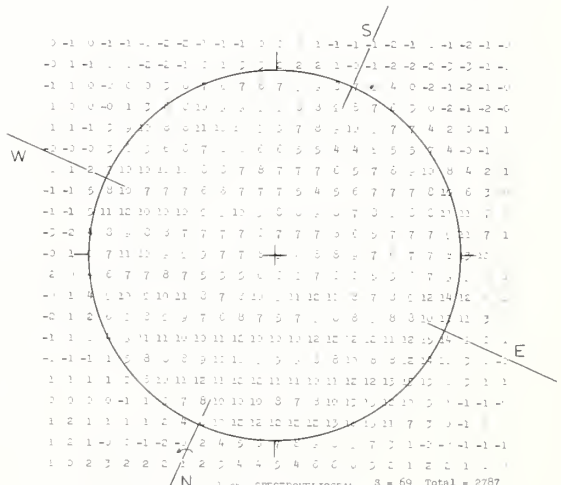
9.1 cm SPECTROHELIOGRAM S = 70 Total = 3476

Stanford, 1964 Apr 28, 20-21 hrs UT; Brightness Unit = 2.4 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 69 Total = 3895

Stanford, 1964 Apr 29, 20-21 hrs UT; Brightness Unit = 2.1 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 69 Total = 2787

Stanford, 1964 Apr 30, 20-21 hrs UT; Brightness Unit = 3.0 x 10^3 °K.

IVm FLUX DENSITY OF ISOLATED ACTIVE REGIONS AT 9.1 cm WAVELENGTH BASED ON STANFORD SPECTROHELIOGRAMS

Flux densities of about 60 sources of solar microwave emission, observed during 1960 and 1962, have been determined by G. Swarup*, V. K. Kapahi* and S. C. Rose+, using Stanford 9.1 cm spectroheliograms. Values of flux density are given in units of 10^{-22} watts m^{-2} (c/s)-1, and are estimated to have an accuracy of $\pm$ 15%. Flux densities were determined from readings made at discrete intervals. The sum of the readings was multiplied by a calibration factor based on Covington's value for whole-sun flux density for the day. The McMath number of the associated calcium plage is given at the top of each column. The central meridian passage, CMP, and latitude values have been determined from the 9.1 cm radio maps. The data are given on the following pages.

* Tata Institute of Fundamental Research, Colaba, Bombay-5.
+ Stanford Radio Astronomy Institute, Stanford, Calif.

McMATH NO.	5625		5627		5630		5642		5645		5649	
CMP & LAT.	10.8 APR.	S12	13.6 APR.	N09	16.2 APR.	S11	27.6 APR.	N11	30.4 APR.	S07	6.3 MAY	N13
DAYS FROM CMP	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY
-8					APR. 7	NI						
-7	APR. 3	ND	APR. 6	ND	8	~ 4.9	APR. 20	~ 3.8	APR. 23	~ 13.3	APR. 29	
-6	4	ND	7	NI	9	~ 11.5	21	~ 6.7	24	8.9	30	ND
-5	5	~ 4.8	8	~ 4.9	10	~ 17.2	22	16.6	25	ND	MAY 1	NI
-4	6	ND	9	~ 9.9	11	≈ 15.3	23	26.0	26	ND	2	ND
-3	7	~ 11.8	10	~ 12.6	12	19.6	24	14.7	27	14.4	3	~ 9.3
-2	8	~ 10.5	11	~ 13.3	13	17.0	25	ND	28	16.4	4	~ 6.5
-1	9	~ 12.5	12	ND	14	26.4	26	ND	29	18.7	5	10.3
0	10	~ 9.7	13	17.0	15	ND	27	11.2	30	ND	6	13.0
1	11	~ 6.9	14	22.2	16	20.9	28	8.3	MAY 1	10.6	7	16.4
2	12	≈ 5.4	15	20.8	17	13.9	29	ND	2	ND	8	10.4
3	13	~ 5.9	16	ND	18	14.1	30	ND	3	NI	9	10.9
4	14	~ 8.3	17	13.6	19	12.8	MAY 1	~ 14.5	4	NI	10	9.3
5	15	~ 7.3	18	15.8	20	9.1	2	ND	5	NI	11	~ 9.9
6	16	NI	19	9.2	21	17.5	3	NI	6	NI	12	~ 12.5
7	17	ND	20	NI	22		4	NI	7		13	NI
							5					

McMATH NO.			5654		5669		5679		5680		5693	
CMP & LAT.	7.0 MAY	S08	8.2 MAY	N29	25.2 MAY	N12	2.9 JUNE	S11	5.1 JUNE	N30	12.3 JUNE	N11
DAYS FROM CMP	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY	DATE 1960	FLUX DENSITY
-8							MAY 25	NI	MAY 27	ND	JUNE 4	ND
-7	APR. 29	ND		NI	MAY 17	~ 4.3	26	≈ 4.7	28	8.6	5	7.7
-6	30	NI	MAY 1	ND	18	~ 5.2	27	7.8	29	21.3	6	10.4
-5	MAY 1	ND	2	NI	19	~ 5.1	28	ND	30	17.3	7	11.4
-4	2	NI	3	~ 3.2	20	~ 4.5	29	19.5	31	19.2	8	ND
-3	3	11.7	4	~ 7.4	21	5.3	30	19.9	JUNE 1	36.5	9	~ 10.7
-2	4	10.0	5	~ 5.9	22	12.7	31	18.7	2	ND	10	~ 13.4
-1	5	19.0	6	11.2	23	20.5	JUNE 1	17.7	3	ND	11	9.3
0	6	~ 15.3	7	ND	24	21.9	2	17.4	4	17.5	12	10.5
1	7	≈ 10.1	8	14.9	25	20.9	3	ND	5	23.3	13	ND
2	8	~ 8.7	9	14.0	26	25.2	4	ND	6	19.2	14	11.5
3	9	≈ 8.1	10	ND	27	ND	5	~ 14.2	7	ND	15	6.3
4	10	≈ 7.0	11	18.6	28	20.7	6	ND	8	15.7	16	~ 5.5
5	11	NI	12	18.3	29	15.0	7	≈ 16.4	9	17.6	17	NI
6	12	NI	13	ND	30	~ 8.7	8	ND	10	12.9	18	NI
7	13		14	8.9	31		9	NI	11	7.6	19	
8	14		15	NI								

COMMERCE - STANDARDS - BOULDER

Symbols: ND = no data

NI = not isolated

McMATH NO.	5694	
CMP & LAT.	14.4 JUNE	N19
DAYS FROM CMP	DATE 1960	FLUX DENSITY
-8		
-7	JUNE 7	NI
-6	8	ND
-5	9	~ 8.0
-4	10	~ 18.5
-3	11	~ 12.7
-2	12	14.1
-1	13	ND
0	14	14.4
1	15	16.6
2	16	13.2
3	17	17.0
4	18	~ 11.6
5	19	8 .7
6	20	~ 4.6
7	21	
8		

5695	
15.9 JUNE	S12
DATE 1960	FLUX DENSITY
JUNE 7	7.5
8	ND
9	9.9
10	13.9
11	21.1
12	26.3
13	ND
14	23.1
15	21.5
16	16.3
17	13.9
18	11.4
19	21.0
20	10.4
21	7.0
22	~ 2.5

5713	
25.9 JUNE	N20
DATE 1960	FLUX DENSITY
JUNE 18	
19	5.3
20	7.7
21	~ 8.8
22	7.9
23	12.2
24	10.3
25	12.8
26	14.9
27	12.3
28	11.2
29	12.4
30	11.3
JULY 1	4.6
2	NI

5724	
1.9 JULY	N30
DATE 1960	FLUX DENSITY
JUNE 24	
25	~ 10.4
26	~ 13.8
27	24.1
28	26.1
29	23.4
30	21.5
JULY 1	26.5
2	ND
3	14.4
4	ND
5	≈ 16.0
6	≈ 15.0
7	NI
8	NI

5726	
3.6 JULY	N08
DATE 1960	FLUX DENSITY
JUNE 26	NI
27	8.5
28	29.4
29	31.1
30	~ 33.2
JULY 1	39.9
2	ND
3	42.7
4	ND
5	44.7
6	27.0
7	24.5
8	~ 27.5
9	21.7
10	16.8

5737	
8.6 JULY	N13
DATE 1960	FLUX DENSITY
JULY 1	NI
2	ND
3	17.7
4	ND
5	14.2
6	14.9
7	11.8
8	15.8
9	11.4
10	12.1
11	≈ 6.7
12	NI
13	
14	
15	

McMATH NO.	5740	
CMP & LAT.	10.5 JULY	N14
DAYS FROM CMP	DATE 1960	FLUX DENSITY
-8		
-7	JULY 3	NI
-6	4	ND
-5	5	NI
-4	6	NI
-3	7	6.3
-2	8	15.5
-1	9	22.1
0	10	23.0
1	11	15.4
2	12	10.4
3	13	10.5
4	14	10.5
5	15	8.5
6	16	NI
7	17	NI
8		

5749	
16.8 JULY	N13
DATE 1960	FLUX DENSITY
JULY 9	≈ 7.1
10	10.8
11	6.6
12	10.6
13	~ 10.1
14	10.8
15	17.8
16	23.0
17	28.2
18	35.0
19	22.2
20	ND
21	22.1
22	12.7
23	ND

5775	
30.5 JULY	N09
DATE 1960	FLUX DENSITY
JULY 23	ND
24	16.6
25	≈ 16.2
26	25.0
27	18.2
28	30.3
29	37.5
30	ND
31	21.6
AUG. 1	22.3
2	25.9
3	ND
4	11.9
5	~ 7.1
6	ND

5794	
13.6 AUG.	N16
DATE 1960	FLUX DENSITY
AUG. 5	~ 9.5
6	ND
7	ND
8	ND
9	ND
10	23.7
11	27.1
12	23.7
13	ND
14	ND
15	16.7
16	11.7
17	10.7
18	10.3
19	≈ 9.1
20	NI

5797	
14.8 AUG.	S14
DATE 1960	FLUX DENSITY
AUG. 7	ND
8	ND
9	ND
10	NI
11	≈ 11.5
12	≈ 18.3
13	ND
14	ND
15	17.7
16	17.7
17	12.5
18	NI
19	≈ 15.5
20	ND
21	NI

5799	
17.1 AUG.	N17
DATE 1960	FLUX DENSITY
AUG. 9	NI
10	~ 18.3
11	21.5
12	ND
13	ND
14	28.9
15	25.5
16	25.7
17	29.5
18	18.7
19	ND
20	NI
21	NI
22	
23	

5801	
18.6 AUG.	S13
DATE 1960	FLUX DENSITY
AUG. 12	
13	NI
14	ND
15	NI
16	~ 21.1
17	~ 16.3
18	≈ 37.5
19	26.1
20	ND
21	~ 17.1
22	NI
23	NI
24	

McMATH NO.	6377	
CMP & LAT.	0.2 APR.	N02
DAYS FROM CMP	DATE 1962	FLUX DENSITY
-8		
-7		
-6	MAR. 25	ND
-5	26	ND
-4	27	ND
-3	28	ND
-2	29	ND
-1	30	ND
0	31	ND
1	APR. 1	ND
2	2	3.6
3	3	3.4
4	4	4.0
5	5	2.4
6	6	≈ 2.5
7	7	ND

	6379	
	3.1 APR.	S07
	DATE 1962	FLUX DENSITY
	MAR. 27	ND
	28	ND
	29	ND
	30	ND
	31	ND
	APR. 1	ND
	2	2.1
	3	1.9
	4	1.0
	5	1.2
	6	NI
	7	ND
	8	ND
	9	NI

	6386	
	11.3 APR.	N10
	DATE 1962	FLUX DENSITY
	APR. 6	NI
	7	ND
	8	ND
	9	≈ 0.8
	10	≈ 2.4
	11	2.5
	12	4.5
	13	10.8
	14	ND
	15	ND
	16	7.1
	17	7.4
	18	3.6
	19	4.7
	20	NI

	6393	
	16.8 APR.	N08
	DATE 1962	FLUX DENSITY
	APR. 11	NI
	12	NI
	13	NI
	14	ND
	15	ND
	16	11.5
	17	20.0
	18	25.3
	19	17.5
	20	20.8
	21	ND
	22	ND
	23	≈ 12.9
	24	13.5
	25	6.1
	26	≈ 6.8

	6396	
	20.8 APR.	S12
	DATE 1962	FLUX DENSITY
	APR. 13	
	14	ND
	15	ND
	16	≈ 5.5
	17	7.2
	18	≈ ≈ 5.7
	19	≈ 8.2
	20	≈ 4.4
	21	ND
	22	ND
	23	6.4
	24	6.2
	25	NI
	26	≈ ≈ 6.4
	27	≈ ≈ 5.8
	28	ND

	6403	
	1.2 MAY	N09
	DATE 1962	FLUX DENSITY
	APR. 23	≈ 6.8
	24	9.4
	25	10.4
	26	15.5
	27	23.5
	28	ND
	29	ND
	30	14.9
	MAY 1	14.5
	2	ND
	3	18.0
	4	14.0
	5	ND
	6	ND
	7	4.8
	8	4.5

McMATH NO.	6411	
CMP & LAT.	6.3 MAY	N19
DAYS FROM CMP	DATE 1962	FLUX DENSITY
-8		
-7	APR. 28	ND
-6	29	ND
-5	30	NI
-4	MAY 1	7.6
-3	2	ND
-2	3	5.4
-1	4	3.8
0	5	ND
1	6	ND
2	7	3.7
3	8	2.5
4	9	2.5
5	10	ND
6	11	ND
7	12	ND
8		

	6412	
	11.5 MAY	N15
	DATE 1962	FLUX DENSITY
	MAY 3	4.4
	4	4.3
	5	ND
	6	ND
	7	5.1
	8	4.1
	9	2.6
	10	ND
	11	ND
	12	ND
	13	ND
	14	ND
	15	ND
	16	3.2
	17	2.3
	18	2.3

	6416	
	14.8 MAY	S09
	DATE 1962	FLUX DENSITY
	MAY 7	≈ 2.5
	8	≈ ≈ 4.2
	9	≈ 5.0
	10	ND
	11	ND
	12	ND
	13	ND
	14	6.0
	15	5.0
	16	4.0
	17	4.9
	18	6.4
	19	ND
	20	ND
	21	≈ 3.4
	22	≈ 5.5

	6426	
	26.3 MAY	N15
	DATE 1962	FLUX DENSITY
	MAY 17	3.0
	18	5.4
	19	ND
	20	ND
	21	20.2
	22	15.6
	23	≈ 22.5
	24	≈ 15.4
	25	≈ 16.7
	26	ND
	27	ND
	28	≈ 15.1
	29	≈ ≈ 22.1
	30	≈ ≈ 13.0
	31	≈ 12.1
	JUNE 1	ND

	6427	
	27.8 MAY	S08
	DATE 1962	FLUX DENSITY
	MAY 20	ND
	21	NI
	22	14.1
	23	10.9
	24	≈ 23.9
	25	18.4
	26	ND
	27	ND
	28	17.8
	29	≈ 15.8
	30	≈ 16.5
	31	16.5
	JUNE 1	ND
	2	ND
	3	ND
	4	≈ 2.9

	6432	
	3.9 JUNE	S18
	DATE 1962	FLUX DENSITY
	MAY 27	ND
	28	1.0
	29	0.5
	30	1.3
	31	1.5
	JUNE 1	ND
	2	ND
	3	ND
	4	ND
	5	0.5
	6	≈ 0.2
	7	0.9
	8	1.2
	9	ND
	10	ND
	11	≈ 1.6

McMATH NO.	6436	
CMP & LAT.	5.8 JUNE	N09
DAYS FROM CMP	DATE 1962	FLUX DENSITY
-8		
-7	MAY 29	NI
-6	30	NI
-5	31	NI
-4	JUNE 1	ND
-3	2	ND
-2	3	ND
-1	4	ND
0	5	0.8
1	6	ND
2	7	1.5
3	8	1.1
4	9	ND
5	10	ND
6	11	2.9
7	12	ND
8		

6441	
10.9 JUNE	S09
DATE 1962	FLUX DENSITY
JUNE 3	ND
4	6.8
5	8.0
6	≈ 11.7
7	8.7
8	9.2
9	ND
10	ND
11	5.1
12	ND
13	2.8
14	≈ 7.7
15	4.2
16	ND
17	ND

6445	
14.8 JUNE	S12
DATE 1962	FLUX DENSITY
JUNE 7	NI
8	≈ 2.5
9	ND
10	ND
11	0.7
12	ND
13	3.6
14	ND
15	3.8
16	ND
17	ND
18	9.7
19	ND
20	5.1
21	4.1
22	3.4

6452	
16.6 JUNE	N10
DATE 1962	FLUX DENSITY
JUNE 9	ND
10	ND
11	NI
12	ND
13	2.9
14	ND
15	3.1
16	ND
17	ND
18	4.4
19	ND
20	6.0
21	5.8
22	3.6
23	ND

6459	
23.1 JUNE	N16
DATE 1962	FLUX DENSITY
JUNE 15	1.2
16	ND
17	ND
18	8.2
19	ND
20	14.7
21	5.7
22	8.8
23	ND
24	ND
25	5.1
26	6.7
27	ND
28	NI
29	NI

6460	
24.0 JUNE	S08
DATE 1962	FLUX DENSITY
JUNE 16	ND
17	ND
18	NI
19	ND
20	NI
21	1.9
22	1.6
23	ND
24	ND
25	3.1
26	4.1
27	ND
28	3.4
29	3.2
30	ND

McMATH NO.	6463	
CMP & LAT.	30.5 JUNE	0
DATE FROM CMP	DATE 1962	FLUX DENSITY
-8		
-7	JUNE 23	ND
-6	24	ND
-5	25	7.1
-4	26	12.6
-3	27	ND
-2	28	9.3
-1	29	10.7
0	30	ND
1	JULY 1	ND
2	2	10.5
3	3	13.7
4	4	13.6
5	5	7.8
6	6	≈ 4.1
7	7	≈ 2.7
8		

6466	
1.1 JULY	S20
DATE 1962	FLUX DENSITY
JUNE 23	ND
24	ND
25	≈ 5.2
26	≈ 6.4
27	ND
28	2.3
29	1.9
30	ND
JULY 1	ND
2	2.3
3	≈ 4.8
4	4.2
5	3.5
6	3.2
7	2.5
8	≈ 3.1

6480	
12.8 JULY	N08
DATE 1962	FLUX DENSITY
JULY 4	2.1
5	2.7
6	4.8
7	9.3
8	6.7
9	4.9
10	5.6
11	5.1
12	5.6
13	7.0
14	6.4
15	6.4
16	6.3
17	≈ 6.9
18	3.7
19	3.8

6492	
19.6 JULY	N15
DATE 1962	FLUX DENSITY
JULY 12	NI
13	NI
14	NI
15	NI
16	1.5
17	ND
18	2.2
19	NI
20	1.3
21	2.0
22	2.5
23	2.4
24	≈ 3.3
25	3.3
26	NI

6494	
22.5 JULY	N05
DATE 1962	FLUX DENSITY
JULY 15	NI
16	2.9
17	ND
18	3.7
19	NI
20	1.2
21	1.0
22	2.1
23	1.4
24	≈ 1.1
25	NI
26	NI
27	ND
28	NI

6497	
27.6 JULY	0
DATE 1962	FLUX DENSITY
JULY 19	0.9
20	2.1
21	2.5
22	2.7
23	2.2
24	ND
25	ND
26	1.2
27	ND
28	0.9
29	1.9
30	≈ 1.7
31	2.8
AUG. 1	ND
2	≈ 4.0

McMATH NO.	6510		6514		6516		6542		6546		6548		6553	
CMP & LAT.	7.2 AUG.	N09	13.3 AUG.	N07	19.8 AUG.	N03	2.9 SEPT.	N09	8.4 SEPT.	N05	9.8 SEPT.	S12	17.6 SEPT.	N25
DAYS FROM CMP	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY
-8					AUGU.11	3.1								
-7	JULY 30	NI	AUG. 6	NI	12	4.3	AUG. 26		SEPT. 1	3.5			SEPT.10	
-6	31	NI	7	NI	13	3.4	27		2	5.1	SEPT. 3	NI	11	3.8
-5	AUG. 1	ND	8	NI	14	5.2	28	NI	3	4.5	4	NI	12	7.5
-4	2	NI	9	NI	15	ND	29	NI	4	7.8	5	NI	13	10.7
-3	3	NI	10	NI	16	ND	30	0.7	5	6.2	6	4.8	14	16.9
-2	4	NI	11	NI	17	ND	31	1.5	6	5.5	7	6.9	15	ND
-1	5	NI	12	NI	18	3.5	SEPT. 1	6.7	7	5.1	8	8.1	16	10.4
0	6	1.5	13	5.0	19	4.6	2	7.4	8	7.2	9	7.2	17	8.5
1	7	≈ 1.7	14	8.2	20	5.1	3	13.8	9	7.4	10	5.3	18	11.5
2	8	ND	15	ND	21	7.8	4	18.6	10	5.5	11	4.6	19	9.3
3	9	≈ 1.6	16	ND	22	5.6	5	14.2	11	5.0	12	NI	20	7.4
4	10	ND	17	ND	23	ND	6	11.4	12	NI	13	NI	21	NI
5	11	1.9	18	5.7	24	ND	7	9.6	13	NI	14	NI	22	ND
6	12	2.3	19	3.3	25	3.0	8	8.6	14	NI	15	ND	23	3.0
7	13	≈ 2.5	20	4.1	26	3.0	9	3.7	15	ND	16		24	1.8
8					27	≈ 3.0	10	2.0	16					

McMATH NO.	6560		6562		6566		6570		6579		6581		6591	
CMP & LAT.	26.9 SEPT.	N10	29.3 SEPT.	N10	5.0 OCT.	N10	11.5 OCT.	N04	14.8 OCT.	S12	18.5 OCT.	N03	26.5 OCT.	N12
DATE FROM CMP	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY	DATE 1962	FLUX DENSITY
-8														
-7	SEPT.19		SEPT.22	ND	SEPT.28	1.1	OCT. 5	2.5	OCT. 8	NI	OCT.11	ND	OCT.19	~ 6.7
-6	20	NI	23	2.3	29	3.4	6	3.0	9	4.3	12	NI	20	3.5
-5	21	4.3	24	2.8	30	≈ 9.6	7	ND	10	6.1	13	ND	21	3.7
-4	22	ND	25	ND	OCT. 1	8.9	8	ND	11	ND	14	ND	22	ND
-3	23	5.3	26	4.4	2	6.5	9	4.9	12	9.3	15	2.0	23	6.3
-2	24	4.6	27	4.3	3	6.0	10	8.4	13	ND	16	3.6	24	9.6
-1	25	ND	28	2.7	4	6.8	11	ND	14	ND	17	6.0	25	7.0
0	26	7.0	29	3.4	5	4.8	12	5.4	15	8.9	18	5.6	26	8.5
1	27	5.4	30	2.6	6	4.0	13	ND	16	7.1	19	2.0	27	8.4
2	28	4.2	OCT. 1	3.8	7	ND	14	ND	17	NI	20	4.5	28	ND
3	29	3.4	2	NI	8	ND	15	8.3	18	NI	21	6.2	29	7.7
4	30	3.7	3	NI	9	4.3	16	7.2	19	NI	22	ND	30	8.0
5	OCT. 1	3.8	4	NI	10	3.3	17	NI	20		23	NI	31	6.5
6	2	NI	5		11	ND	18	NI			24	NI	1	ND
7													2	ND
8														

COMMERCE - STANDARDS - BOULDER

COSMIC RAY INDICES

(Climax Neutron Monitor)

IGC Station B 305

MARCH 1964

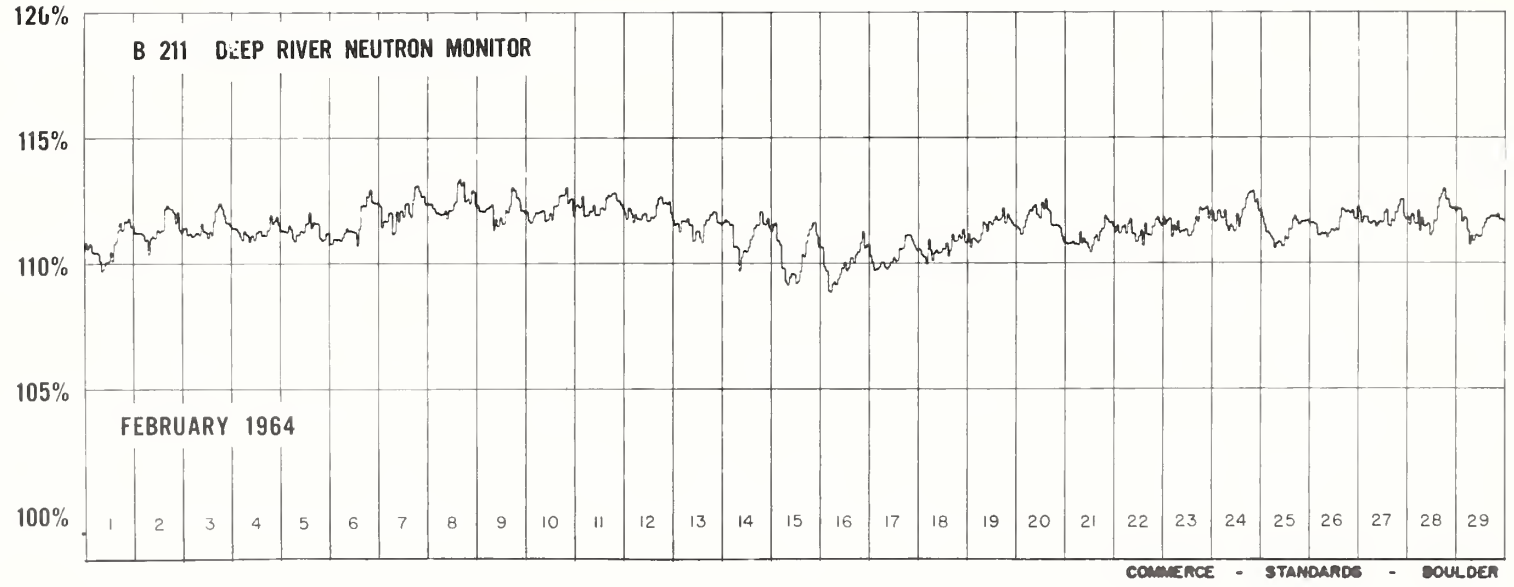
MAR. 1964	DAILY AVERAGE COUNTS / HOUR *	MAR. 1964	DAILY AVERAGE COUNTS / HOUR *
1	3238.3 ** <40	17	3234.4
2	3262.5	18	3246.4
3	3268.9 ** <40	19	3252.5
4	3284.9	20	3246.0
5	3266.4	21	3240.6
6	3267.6	22	3249.6
7	3269.8	23	3262.7
8	3263.7	24	3264.5
9	3259.6	25	3252.6
10	3277.1	26	3246.0
11	3271.5	27	3255.8
12	3268.6	28	3244.1
13	3269.6	29	3240.2
14	3251.0	30	3254.4
15	3245.8	31	3256.8
16	3244.0		

COMMERCE - STANDARDS - BOULDER

* Scaling Factor 128
** No. of Section Hours

COSMIC RAY INDICES

(Pressure Corrected Hourly Totals)



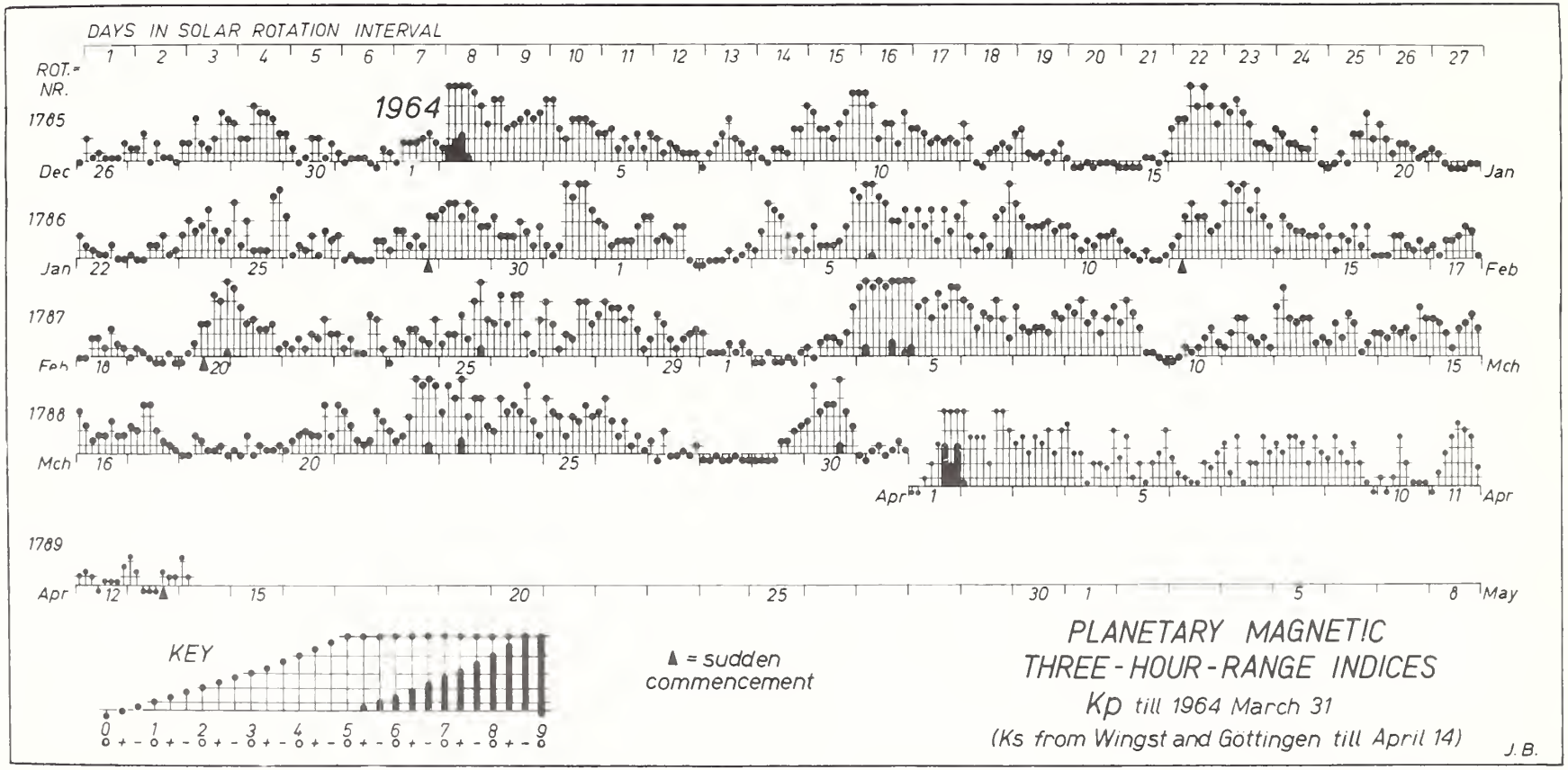
Note: The March 1964 Deep River Neutron Monitor data were published out of sequence in CRPL-F 236B. The above February 1964 data should have been in that issue.

GEOMAGNETIC ACTIVITY INDICES

MARCH 1964

March 1964	C	Values Kp — Three hour Gr. interval 1 2 3 4	5 6 7 8	Sum	Ap	Final Selected Days
1	0.1	2o 1- 1- 1-	1+ 1- 1+ 1-	8o	4	Five
2	0.0	0o 0o 1- 0o	0o 0+ 0o 1-	2-	1	Quiet
3	0.7	1o 0+ 1+ 2-	2- 1+ 2o 4-	13o	7	
4	1.7	5- 6- 5- 5o	5- 6o 5o 5+	41o	52	2
5	1.5	6- 4- 4o 3o	4+ 4- 5- 5-	34-	33	18
						19
6	1.0	4o 4- 2+ 3+	3o 4o 3o 2-	25o	17	28
7	0.8	4- 2+ 2o 2+	2+ 2o 3+ 3o	21o	12	31
8	1.0	4- 3+ 4o 3-	3+ 2o 3o 4-	26-	18	
9	0.4	3- 4o 3+ 2+	1- 1- 0+ 0o	14o	9	
10	0.3	0o 0+ 1o 1-	1o 2- 2+ 1+	8+	4	
11	0.5	1o 2o 3o 3o	2- 1+ 2- 1o	15-	8	Five
12	1.0	4- 5- 3o 3-	3o 3o 1+ 2-	23o	16	Disturbed
13	0.4	1+ 3- 2- 3+	3- 1- 1+ 2o	16-	8	
14	0.7	2o 2- 2+ 2o	2+ 2- 4- 3o	19-	10	4
15	0.7	3o 3- 2o 1o	2+ 3- 3+ 2+	19+	11	5
						22
16	0.4	3+ 2+ 1+ 2-	2- 3- 2- 2-	16+	8	23
17	0.5	2+ 2o 4- 4-	2o 1+ 1o 1-	17-	10	30
18	0.1	0+ 0+ 2- 1+	1- 1- 1o 0+	6+	3	
19	0.0	1- 0+ 2- 0+	1o 1- 1- 1o	6+	3	
20	0.6	1- 1+ 2- 2o	2- 2- 4- 2-	14+	8	
21	0.9	4- 3+ 2+ 1+	1o 1+ 3+ 3-	19o	12	Ten
22	1.3	2o 1+ 2- 3o	5o 5- 6- 5-	28o	28	Quiet
23	1.3	3+ 5- 4o 6o	3o 4o 4o 2+	31+	30	
24	1.1	2o 4o 3+ 4-	3+ 5- 3- 2-	25+	19	1
25	0.9	4o 3+ 3o 2-	3o 3- 4- 3o	24+	16	2
						3
26	0.4	3+ 4o 3- 2-	3- 1o 2- 1-	18-	11	10
27	0.1	1+ 0o 2o 0+	0+ 1- 0+ 1o	6o	3	18
28	0.0	0o 0o 0+ 0o	0o 0+ 0o 0o	1-	0	19
29	0.2	0o 0o 0o 0o	1+ 1+ 2o 2+	7o	3	27
30	1.3	3- 5- 3+ 4-	4- 6- 3+ 2+	29+	26	28
31	0.1	0+ 0o 1- 1o	0+ 1- 1+ 1-	5o	3	29
						31
Mean:	0.64			Mean:	13	

COMMERCE - STANDARDS - BOULDER


DAYS IN SOLAR ROTATION INTERVAL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
ROT.-NR.
1964
1785
Dec 26 30 1 5 10 15 20 Jan
1786
Jan 22 25 30 1 5 10 15 17 Feb
1787
Feb 18 20 25 29 1 5 10 15 Mch
1788
Mch 16 20 25 30
Apr 1 5 10 11 Apr
1789
Apr 12 15 20 25 30 1 5 8 May
KEY
0 + - 1 + - 2 + - 3 + - 4 + - 5 + - 6 + - 7 + - 8 + - 9
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1964 March 31
(Ks from Wingst and Göttingen till April 14)
J. B.

COMMERCE - STANDARDS - BOULDER

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

MARCH 1964

NORTH ATLANTIC

MAR 1964	NORTH ATLANTIC 6-HOURLY QUALITY FIGURES				SHORT-TERM FORECASTS ISSUED ABOUT ONE HOUR IN ADVANCE OF:				WHOLE DAY INDEX	ADVANCE FORECASTS (J-REPORTS) FOR WHOLE DAY, ISSUED IN ADVANCE BY:				GEOMAGNETIC K_{FR}	
	00 TO 06	06 TO 12	12 TO 18	18 TO 24	00	06	12	18		1-7 DAYS FINAL J_S	1-7 DAYS SOW J	1-3 DAYS	1-7 DAYS	HALF (1)	DAY (2)
01	5+	5+	7-	7-	5	5	7	6	6_0	6	6			1	1
02	5+	5-	7-	6+	5	5	7	7	6-	6	6			0	0
03	5+	6-	7-	7-	5	5	7	6	6_0	5	5			1	2
04	5_0	4+	5_0	5-	5	4	6	5	5-	5	5			(5)	(4)
05	4o	4-	5+	5_0	4	4	6	5	(4+)	4	4			(4)	(4)
06	4-	3+	6+	6+	4	4	6	5	5_0	4	4			3	2
07	4+	4-	6^0	7-	5	4	6	6	5+	5	5			3	2
08	6-	4+	6_0	7-	5	4	6	6	6-	5	5			3	2
09	5-	3+	6+	6+	6	4	6	6	5_0	6	6			3	1
10	5-	4o	7-	6+	6	4	6	7	5+	6	6			1	1
11	5+	4o	6+	6+	5	4	6	6	6-	5	5			3	1
12	4o	4-	6+	6-	5	4	7	6	5_0	5	5			(4)	2
13	4+	4+	6+	6_0	5	4	6	6	5+	5	5			2	1
14	6-	5_0	7-	6_0	5	5	7	6	6_0	6	6			2	2
15	6-	5+	7-	6+	5	5	7	6	6_0	6	6			2	2
16	5+	5_0	7-	6+	6	5	7	6	6-	6	6			2	2
17	6-	5-	6_0	6_0	5	5	6	6	6-	5	5	6		3	1
18	5+	4o	6+	7-	5	4	6	6	6-	3	3	6		1	1
19	7-	5+	6+	6+	5	4	7	6	6_0	4	4			1	1
20	5+	5_0	7-	7-	6	5	7	6	6_0	5	5			2	2
21	6_0	6-	7-	7-	6	5	7	7	6_0	5	5			2	1
22	6-	6-	7-	6+	5	5	6	6	6_0	6	6			1	(4)
23	6-	4+	7-	6_0	5	4	6	6	6-	6	6			(4)	3
24	5_0	4o	6+	6+	5	4	6	6	5+	6	6			3	3
25	5-	5-	6+	7-	6	4	7	7	6-	5	5			3	3
26	6-	5_0	7-	7-	5	4	7	6	6_0	6	6			3	1
27	6-	4+	6+	6+	6	5	7	7	6-	6	6			1	1
28	6+	5_0	7-	6+	6	5	7	7	6_0	6	6			0	0
29	6_0	5+	7-	7-	6	5	7	7	6+	6	6			0	2
30	5+	5_0	6+	6-	6	4	6	5	6-	4	4			(4)	3
31	4+	5_0	7-	6+	5	4	6	7	6-	4	4			0	0
Score: Quiet Periods				P	11	9	21	17		15	17				
				S	13	8	10	14		11	10				
				U	1	0	0	0		0	0				
				F	0	0	0	0		4	3				
Disturbed Periods				P	2	11	0	0		1	1				
				S	4	3	0	0		0	0				
				U	0	0	0	0		0	0				
				F	0	0	0	0		0	0				

NORTH PACIFIC

NORTH PACIFIC 8-HOURLY QUALITY FIGURES			SHORT-TERM FORECASTS ISSUED AT			WHOLE DAY INDEX	ADVANCE FORECASTS (J_P REPORTS) FOR WHOLE DAY, ISSUED IN ADVANCE BY				GEOMAGNETIC K_{SI}	
03 TO 11	11 TO 19	19 TO 03	02	09	18		1-7 DAYS FINAL J_{PS}	1-7 DAYS SOW J_P	1-3 DAYS	1-7 DAYS	HALF (1)	DAY (2)
7	7	7	7	7	7	7	6	6			1	1
7	6	7	7	7	7	7	6	6			1	0
7	6	7	7	7	7	7	6	6			1	1
7	3	4	7	4	5	6	6	6			(6)	(5)
5	4	4	4	4	5	(4)	4	4			(4)	(4)
6	4	5	5	5	5	5	4	4			(4)	2
6	5	4	5	5	6	(4)	5	5			2	2
6	5	5	5	5	5	5	5	5			3	2
6	5	6	6	5	6	6	5	5			3	0
7	6	5	6	6	6	6	5	5			1	1
7	7	7	6	6	7	7	5	5			2	1
7	6	6	7	6	7	7	7	7			3	2
6	5	7	7	7	7	6	5	5			2	1
6	5	6	7	5	6	6	5	5			2	2
7	6	6	7	6	7	7	6	6			2	2
7	6	6	6	6	7	7	6	6			2	1
7	6	7	7	5	7	7	6	6			2	1
6	6	6	6	5	7	7	6	6			1	0
7	6	6	7	6	6	7	6	6			1	1
7	7	6	7	6	7	7	6	6			1	2
7	7	7	7	7	7	8	6	6			2	1
7	6	6	7	7	6	7	6	6			2	(4)
6	5	6	6	6	6	6	6	6			(4)	3
6	4	6	7	5	6	5	6	6			3	3
6	6	6	6	5	6	6	6	6			2	2
6	5	6	5	5	6	6	6	6			3	2
7	6	6	6	6	6	7	6	6			1	1
EARTHQUAKE NO DATA											0	1
											(4)	3
											1	0
			15	13	18		6					
			12	9	6		17					
			0	1	0		2					
			0	0	0		0					
			0	1	0		1					
			0	3	2		1					
			0	0	0		0					
			0	0	1		0					

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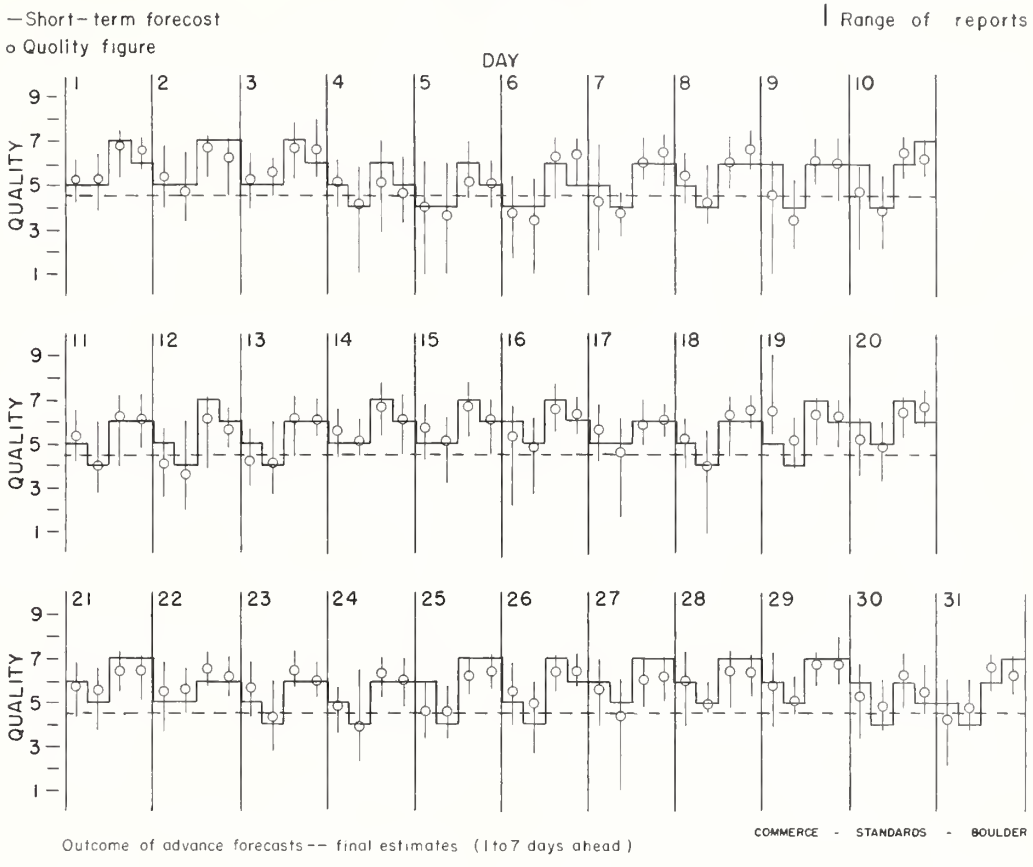
NORTH ATLANTIC

MARCH 1964


—Short-term forecast
o Quality figure
| Range of reports
DAY
QUALITY
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31
9 7 5 3 1
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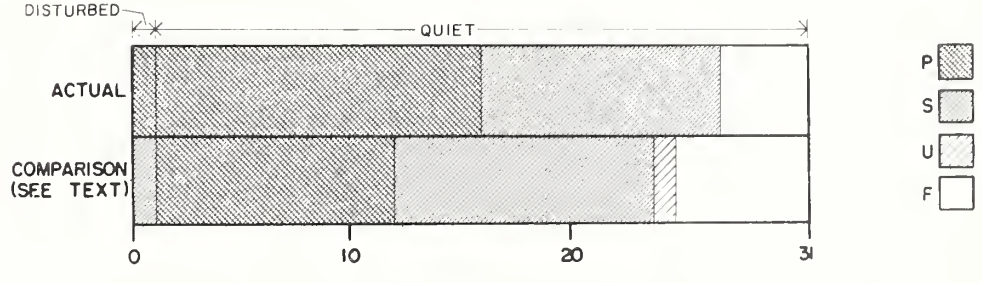
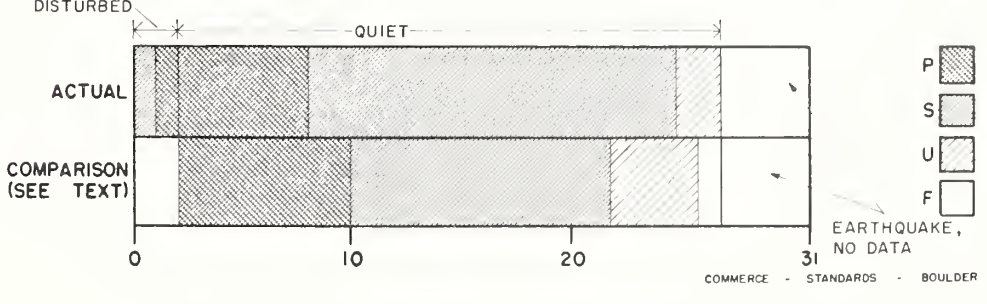
Outcome of advance forecasts -- final estimates (1 to 7 days ahead)

NORTH ATLANTIC

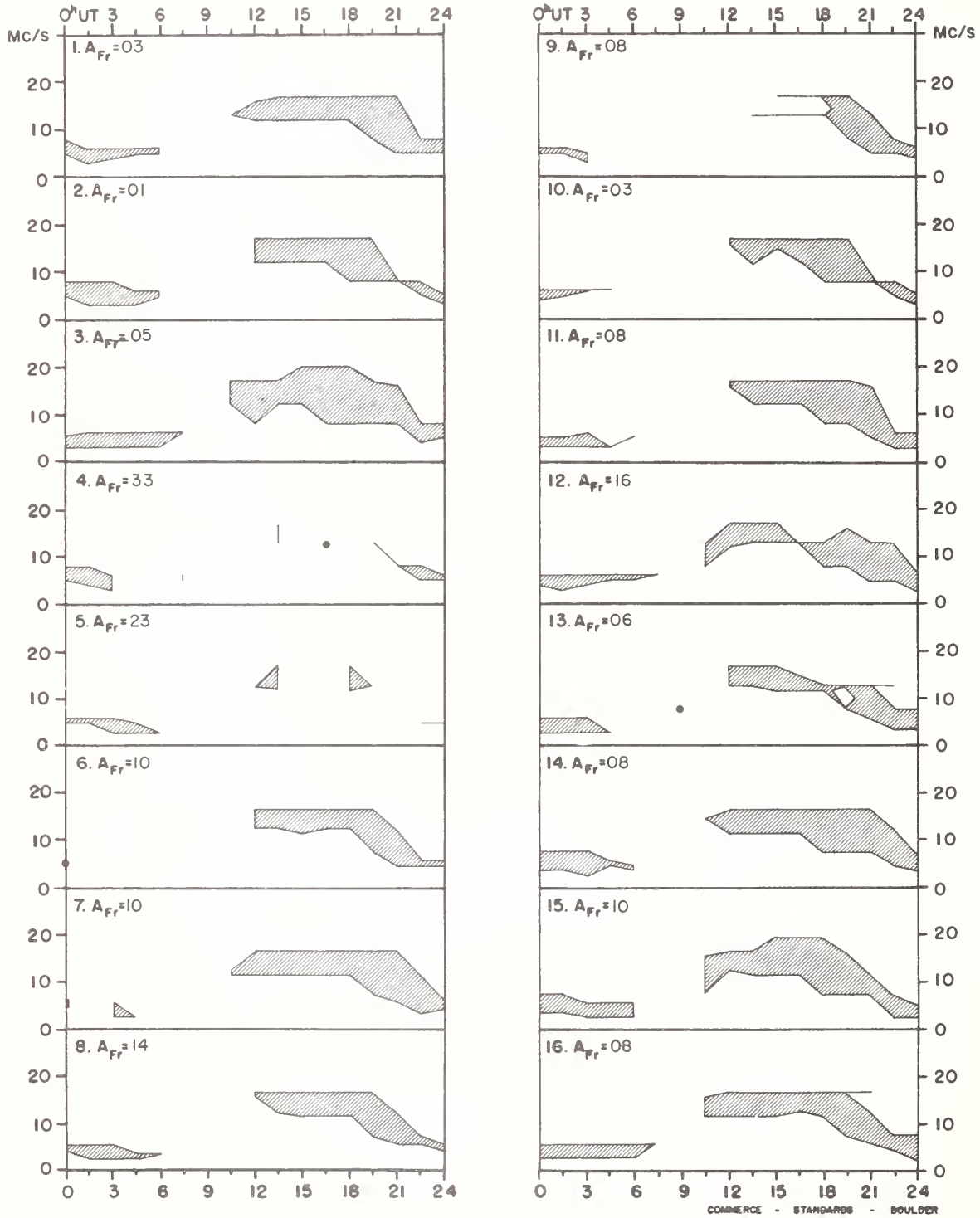


NORTH PACIFIC



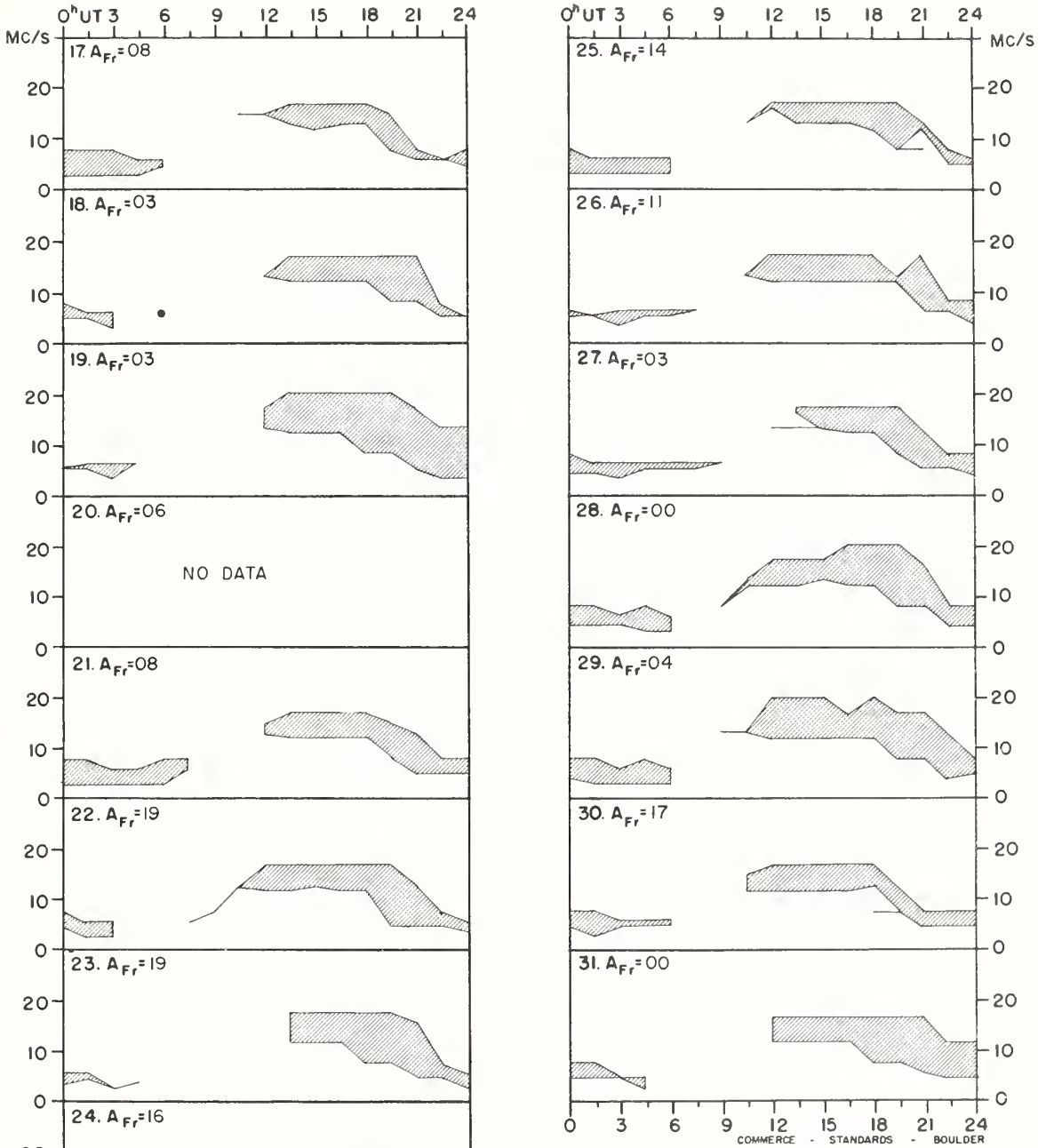
USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

MARCH 1964



USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

MARCH 1964



Adapted from Observations by Deutsches Bundespost

IQSY ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

APRIL 1964

1964	TIME OF ISSUE UT	ADVANCE GEOPHYSICAL ALERT	WORLDWIDE GEOPHYSICAL ALERT			
			NO.	TYPE	TIMING	ELABORATION
2	0400		59	Magnetic Storm	(Exists)(1)	
23	0400		60	Magnetic Calm	Exists	
24	0400		61	Magnetic Calm	Exists	
28	0400		62	Magnetic Storm Solar Calm	Expected Exists	
28	1355	Ft. Belvoir, Magnetic Storm 27/14XX 2				
29	0400		63	Magnetic Storm Solar Calm	Exists Exists	
30			64	Solar Calm	Exists	

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(1) (Exists): The word exists did not actually appear on the telegraphic alert message but was implied by the message.